

PASATAC

PERSONNEL ALLOCATION STUDY AND TECHNICAL APPLICATION OF CRITERIA



California Department of Fish and Game
Wildlife Protection Division

Preliminary Report
Pilot Study Conducted in Region 5
January 1988 thru November 1988

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FORWARD

This is a preliminary report developed to respond to the Department of Finance (DOF). A Budget Change Proposal (BCP) is now under consideration by DOF. The proposal was submitted by the Department of Fish and Game to obtain ten new positions for Region 5 Wildlife Protection. The purpose of the original request was to offset the high vacancy rate and increased mandated training. These factors result in fewer personnel hours being available for field operations. This request was only a stop gap measure support by the recommendations of a 1966 study. Ultimate staffing and deployment needs were to be in the final PASATAC document. This preliminary report provides the background, methodology and analysis of relevant PASATAC data. The final report will contain a more detailed analysis of all data collected.

This preliminary report suggests a very strong need for additional enforcement staff, regardless of the method used to deploy the positions. Justification for the ten personnel years in the BCP appears reasonable in light of the workload indices developed for this study. The justification for even more positions also appears reasonable in light of the study results.

The option to increase positions in the pending BCP seems viable and clearly responsive to changing policies, resource demands and public opinion.

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PART A

INTRODUCTION

1.0 Background and Purpose

The California Department of Fish and Game has the major responsibility to encourage the protection, conservation, maintenance and utilization of fish and wildlife resources for the benefit of all citizens of the State. The Wildlife Protection Division (WPD) of the California Department Fish and Game (CDFG) has been charged with the significant task of enforcing the laws and regulations adopted to meet these responsibilities. The CDFG, State Legislature and constituent groups have identified major goals and objectives to assist in meeting this challenge.

A Study Steering Committee (SSC) was established and included the Region 5 Wildlife Protection (WLP) supervisors, captain level and above, and management personnel from WPD Headquarters and management personnel from the other four administrative regions.

Current staffing levels and their deployment have been the subject of critical review in light of increasing responsibilities, budget constraints, demands for service and other formidable challenges for the future. With this in mind, a comprehensive study of CDFG/WPD staffing was deemed necessary. This study is known as PASATAC, Personnel Allocation Study And Technical Application of Criteria, and was initiated in January 1988 (and completed in November 1988). The purposes of PASATAC are to:

- o Determine current workloads and their relationship to historic workloads within various demographic, geographic or resource oriented categories.
- o Determine relationship of current staffing and optimum staffing needs to meet agency priorities.
- o Review past, present and/or updated staffing allocation criteria in relationship to study results and statistically reliable models.
- o Define options and strategy to achieve adequate enforcement staffing and allocation levels, equipment and support personnel.
- o Make recommendations for staffing levels or allocation modifications to reflect current and future needs to ensure effective enforcement activities, increased compliance and resource protection, and public service.

The PASATAC study was conducted in conjunction with a statewide public attitude survey dealing with wildlife law enforcement in California. The survey was conducted in late May and early June, 1988 by the Survey Research Center, Chico State University, entitled "Attitude Concerning Fish and Wildlife Protection and

Law Enforcement in the State of California".

The major objectives of the study were to:

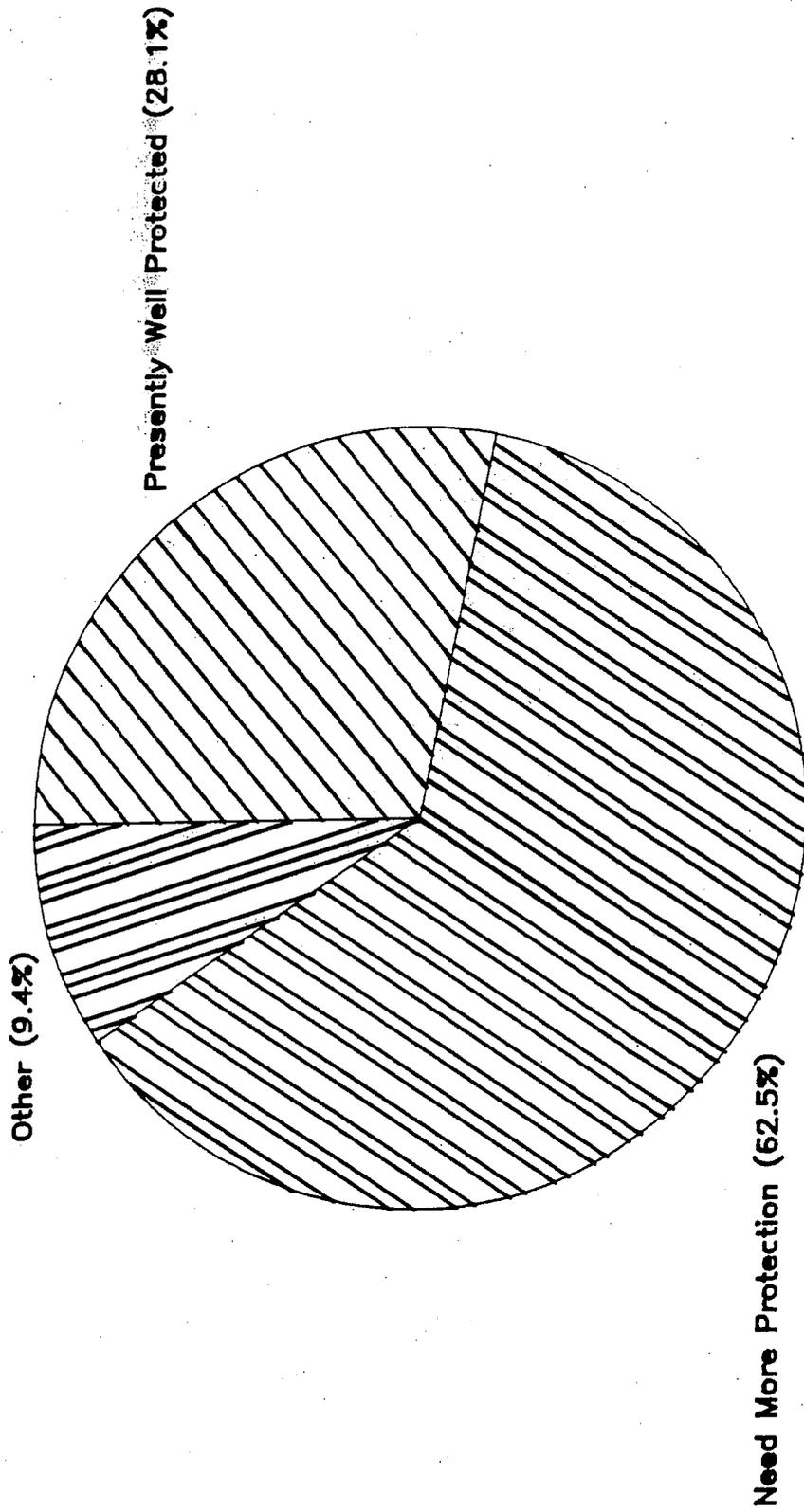
- * Identify and describe consumptive and nonconsumptive users of fish and wildlife resources in California.
- * Identify public attitudes and perceptions concerning threats to and the protection of fish and wildlife.
- * Identify public perceptions regarding the extent of major violations of Fish and Game regulations.
- * Assess public reporting of violations of Fish and Game regulations.
- * Assess public perceptions regarding the effectiveness of major sanctions in preventing or deterring violations of Fish and Game regulations.
- * Identify public opinion concerning the importance of major duties of California game wardens.
- * Identify public preferences with regard to payment for fish and wildlife protection.
- * Identify and describe the level and nature of public contact with game wardens.

Six important conclusions can be drawn from the Chico State Survey :

1. A majority of Californians feel that fish and wildlife need more protection. (See Figure A1) Loss of endangered species and threats to wildlife by pollution and hazardous wastes are believed to be serious threats to fish and wildlife by most Californians. Though hunting or fishing without a license, use of illegal equipment methods, and the illegal sale of fish and wildlife are perceived to be threats by many Californians (67% to 84%), they are rated as less serious threats than loss of endangered species (86%) and pollution (96%).
2. Most Californians believe that fish and wildlife law violators are hardly ever caught. (See Figure A2) Almost one-third have personally observed one or more violations, but most did not report them. A significantly larger percentage of violations were reported to have occurred in CDFG Region 5 than in the other four regions. (Research studies conducted by DFG staff and other states indicate that only 2 to 5% of all wildlife violators are caught or violations discovered.) Only about one-third of the 80 violations which were reported by members of the public were reported to the California Department of Fish and Game, a local game warden, or Cal-TIP. The three main reasons for not reporting were: 1) People did not know where to report; 2) They did not think that the violation was serious, and 3) They did not think that reporting would make a difference.
3. A significantly larger percentage of purely consumptive users believe that heavy fines and jail sentences will be

The Need for Fish & Wildlife Protection

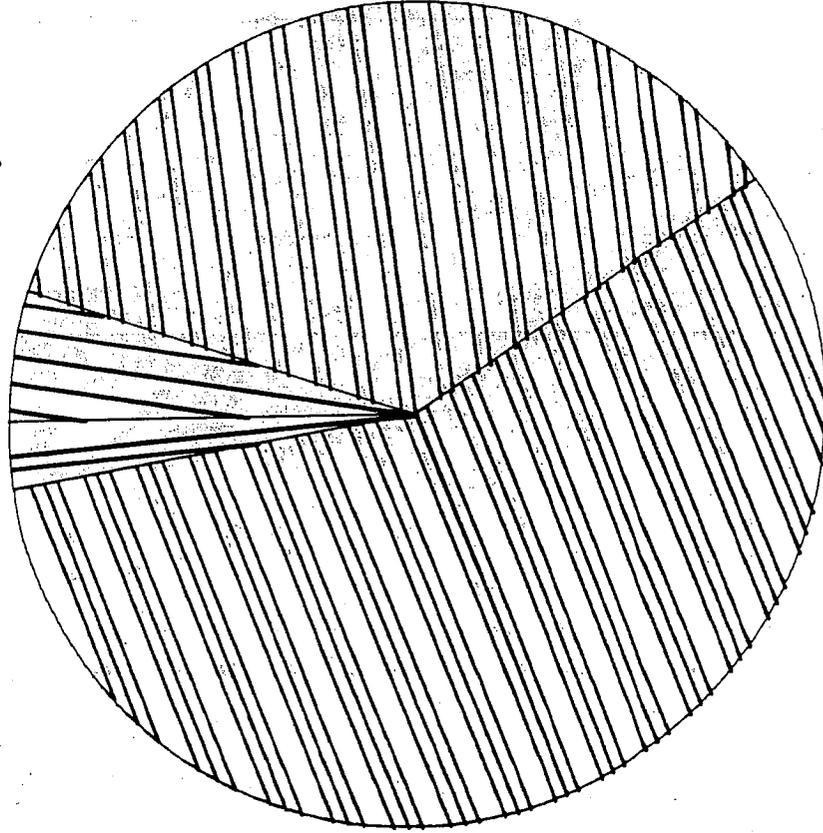
from Public Survey (1988)



How Often are Violators Apprehended?

from Public Survey (1988)

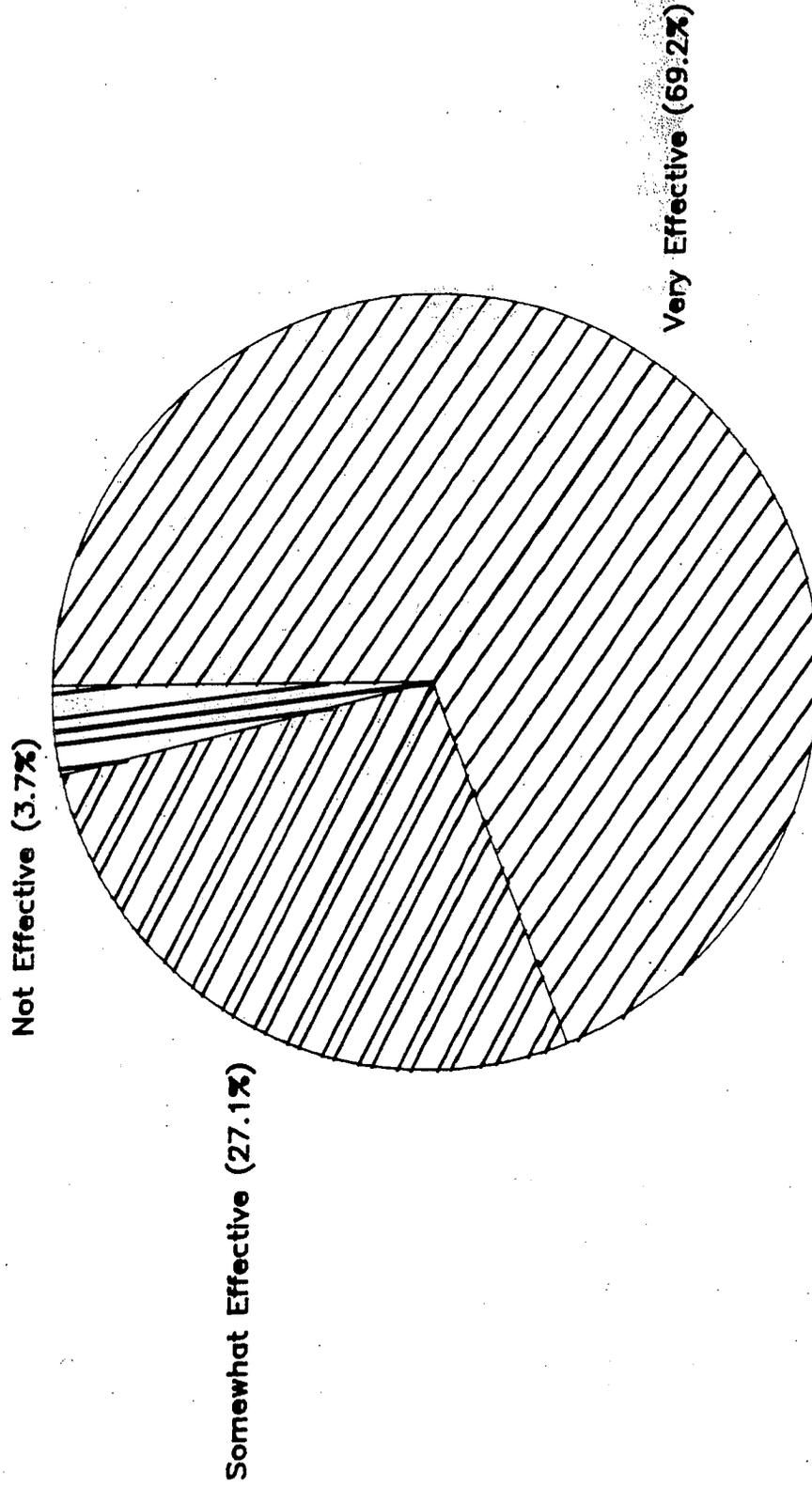
Other (2.7%) Almost Always or Often (5.1%)



Sometimes (35.4%)

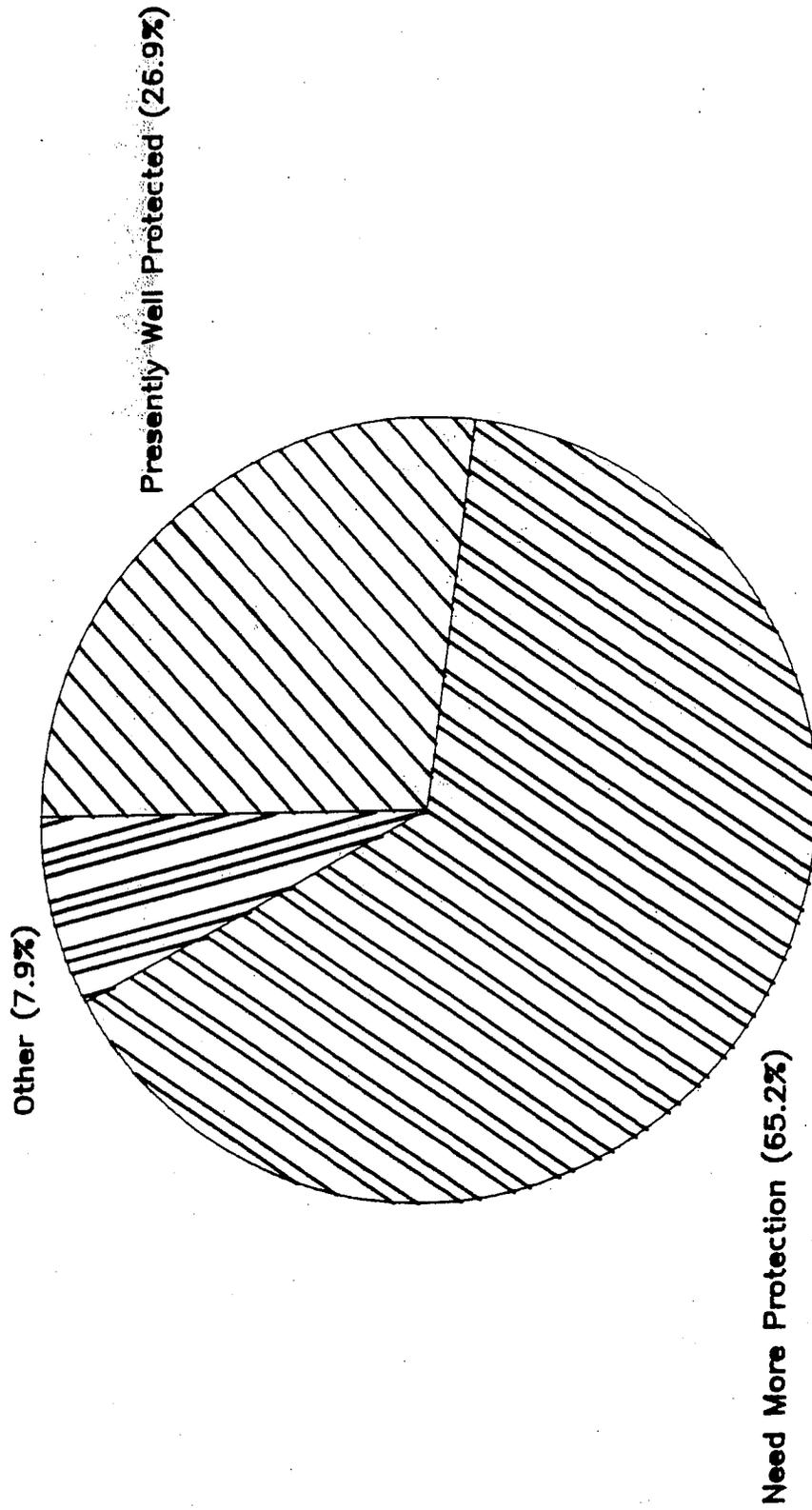
Hardly Ever (56.8%)

**Effectiveness of Increased Patrols
In Reducing Violations (Survey 1988)**



The Need for Habitat Protection

from Public Survey (1988)



effective in reducing fish and wildlife law violations. However, a majority of all wildlife consumers believe that these two methods would be very effective. In addition, most believe that making it easier for the public to report violations, more patrol by game wardens (See Figure A3) and undercover enforcement would be very effective in reducing violations.

4. Most Californians believe that 1) Protecting wildlife habitat (See Figure A4), 2) Enforcing hunting and fishing laws, 3) Enforcing commercial fish laws, 4) Stopping the illegal sale of wild animal parts, and 5) Investigating pollution and hazardous waste problems are very important duties for game wardens. Those respondents who expressed a lot of concern for fish and wildlife most strongly, endorsed these duties. However, most Californians believe that present fish and wildlife law enforcement is only somewhat effective in protecting fish and wildlife resources.
5. Hunters, anglers, and non-consumptive fish and wildlife users who believe that fish and wildlife need more protection were most willing to pay a \$5.00 license fee increase or a \$5.00 voluntary fee for additional fish and wildlife protection services.
6. Less than one-third of all Californians have had contact with a CDFG game warden. However, more than 90% of those who reported having one or more contacts indicated that their contact was positive.

Hearing Committee

Also, the need for additional wildlife protection personnel was made clear during the Joint Informational Hearing on the Department of Fish and Game by the Assembly Water, Parks and Wildlife Committee and the Assembly Governmental Organization Committee. (Hearing transcript, October 27-28, 1987). Throughout the hearing, committee members and those testifying acknowledged that more wardens were needed to enforce Fish and Game laws and regulations. The need for increased staffing was recognized in nearly all areas of enforcement with emphasis on specialized operations, general patrol, commercialization of fish and wildlife and pollution, habitat and other resource protection. The following comments made during the hearings are indicative of the acknowledged need for additional personnel:

a) As Assemblywoman Allen was questioning Department of Fish and Game personnel on the economic value of fish and fish products handled by non-licensed operations, she and Chairman Costa had the following discussion on the need for additional wardens;

ASSEMBLYWOMAN ALLEN: That would have a tremendous economic impact, then, not only on the resource in terms of abundance, but also on the state as a whole for purposes of taxation and management of the resource.

CHAIRMAN COSTA: What they need is more wardens to supervise the job, right?

ASSEMBLYWOMAN ALLEN: I think that's part of the problem, definitely. I think they are under not enough manpower, and perhaps as we get into it today we'll find, perhaps even more problems that contribute to that.

CHAIRMAN COSTA: Or we need to convince this administration, and we have the chairman of the budget subcommittee here that more wardens would help deal with that.

ASSEMBLYWOMAN ALLEN: I think it would help if the Department would put forth a proposal to the Legislature. They do need more manpower, in terms of legislation to draw attention to the fact that you are understaffed.

CHAIRMAN COSTA: All right, moving right along. Let's try to speed things up here. We still have an ambitious schedule this morning to attend. We have Kurt Sjoberg, Chief Deputy Auditor General. You are appearing for Mr. Sjoberg?

b) Later on during the hearing, Chairman Costa was questioning retired Regional Patrol Chief Wictum, who had about 34 years experience with the Department, as follows:

CHAIRMAN COSTA: What do you think the biggest problem today is with the Department of Fish and Game that we could do something about?

MR. WICTUM: Lack of personnel. We're short of wardens, you know. We've talked about the fact that we may have gained six positions and setting up special operations, which has been a big plus, but at the same time we have to think about hours too. We've had this problem which the wardens have had to go from what was traditionally a twelve hour day to an eight hour day. You see the loss that we've had there in just being able to put people in the field. And this is a major problem. Traditionally, the wardens worked a twelve hour day and did it happily and donated their time. Now they can't do that anymore, and this cuts into enforcement posture.

c) Still later during the hearings as Assemblywoman Allen was questioning DFG personnel, she and Chairman Condit exchanged the following statements:

CHAIRMAN CONDIT: Let's not get back into personnel. We've

all decided that there needs to be more...

ASSEMBLYWOMAN ALLEN: Plenty more of the operational special operational units, not necessarily more...

CHAIRMAN CONDIT: Well' I think that we generally have agreed that there needs to be more personnel out there, and I want to tell you that we can write all the laws we want up here but if you don't have the personnel out in the field, it's very difficult to enforce those.

2.0 CALIFORNIA DEPARTMENT FISH AND GAME - WILDLIFE PROTECTION DIVISION ORGANIZATION AND STUDY AREA

The WPD is one of five divisions within the CDFG. It has the greatest number of its assigned personnel and operational resources located throughout the State in either regional or field positions. The regional offices are responsible for resource enforcement operations and public service programs in a specific geographic area. These offices implement divisional policies through their own specialized programs such as fisheries, wildlife management, environmental services and enforcement.

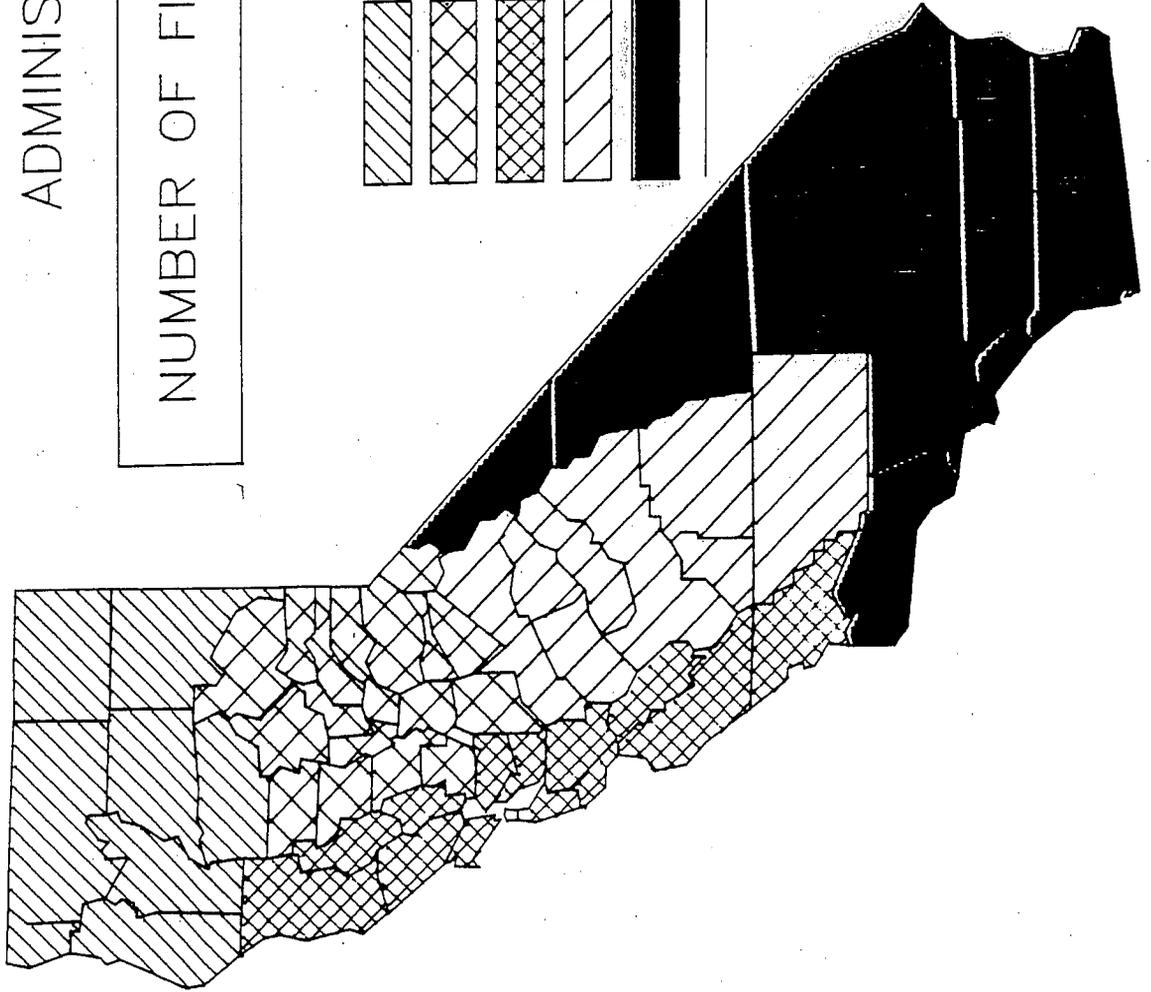
There are five administrative regions in the State. Figure A5 shows the number of sworn field personnel in each Region. A "sworn field position" includes wardens and patrol boat lieutenants only, not designated supervisory positions.

Region 5, as a model for this study, has two administrative captains, five field captains and one patrol boat captain (Figure A6). Field uniformed officers are assigned to each captain having designated geographic responsibilities, usually consistent with county boundaries. The organizational chart in Figure A7 shows the present distribution of R5/WPD personnel. Approximately 76 field positions provide a variety of resource enforcement and public service activities in several categories: sport fish and wildlife protection, commercial fish and wildlife protection, special operations/mutual aid, licenses/permits, depredation and nuisance animals, streambed protection, pollution, public administration/maintenance and uncommitted enforcement time (Table A1).

The Captain District personnel, known as Fish and Game Wardens, are under a Lieutenant's supervision and represent the most direct and localized public and resource protection arm of the CDFG. The field wardens are the primary focus of this study. Historically, WPD has had difficulty in effectively determining where to strategically locate positions, define boundaries, and establish exactly how many field personnel are required in each Captain's District to provide effective public service and favorable levels of compliance. The problem of ensuring adequate

CALIFORNIA DEPARTMENT OF FISH AND GAME
ADMINISTRATIVE REGIONS

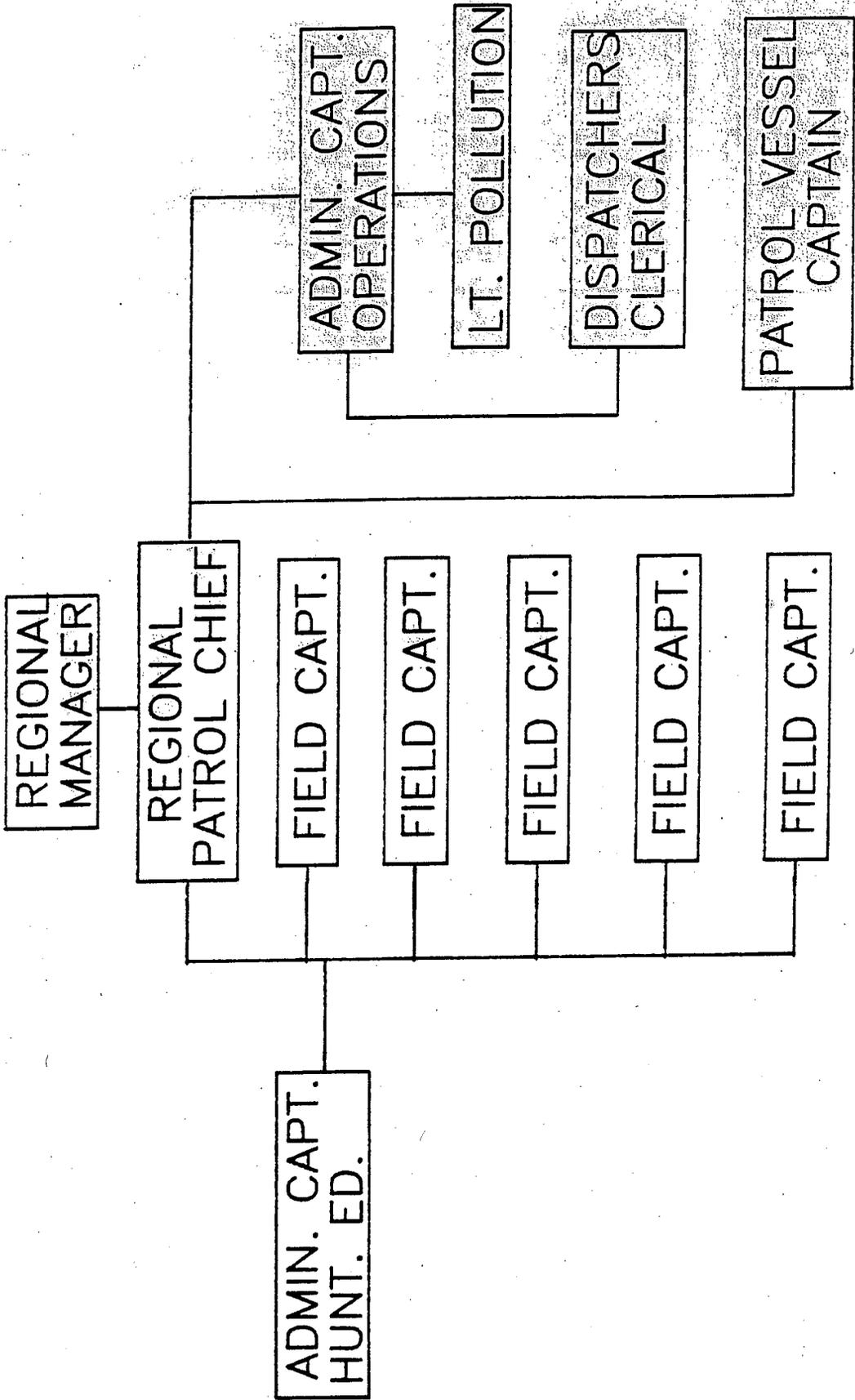
NUMBER OF FIELD SWORN PERSONNEL



	CURRENT 11/1/88	ALLOCATED
Region 1	36	39
Region 2	42	45
Region 3	59	67
Region 4	31	33
Region 5	59	76

TOTAL 227 260

REGION 5 ORGANIZATION



REGION 5
SWORN PERSONNEL
BY COUNTY

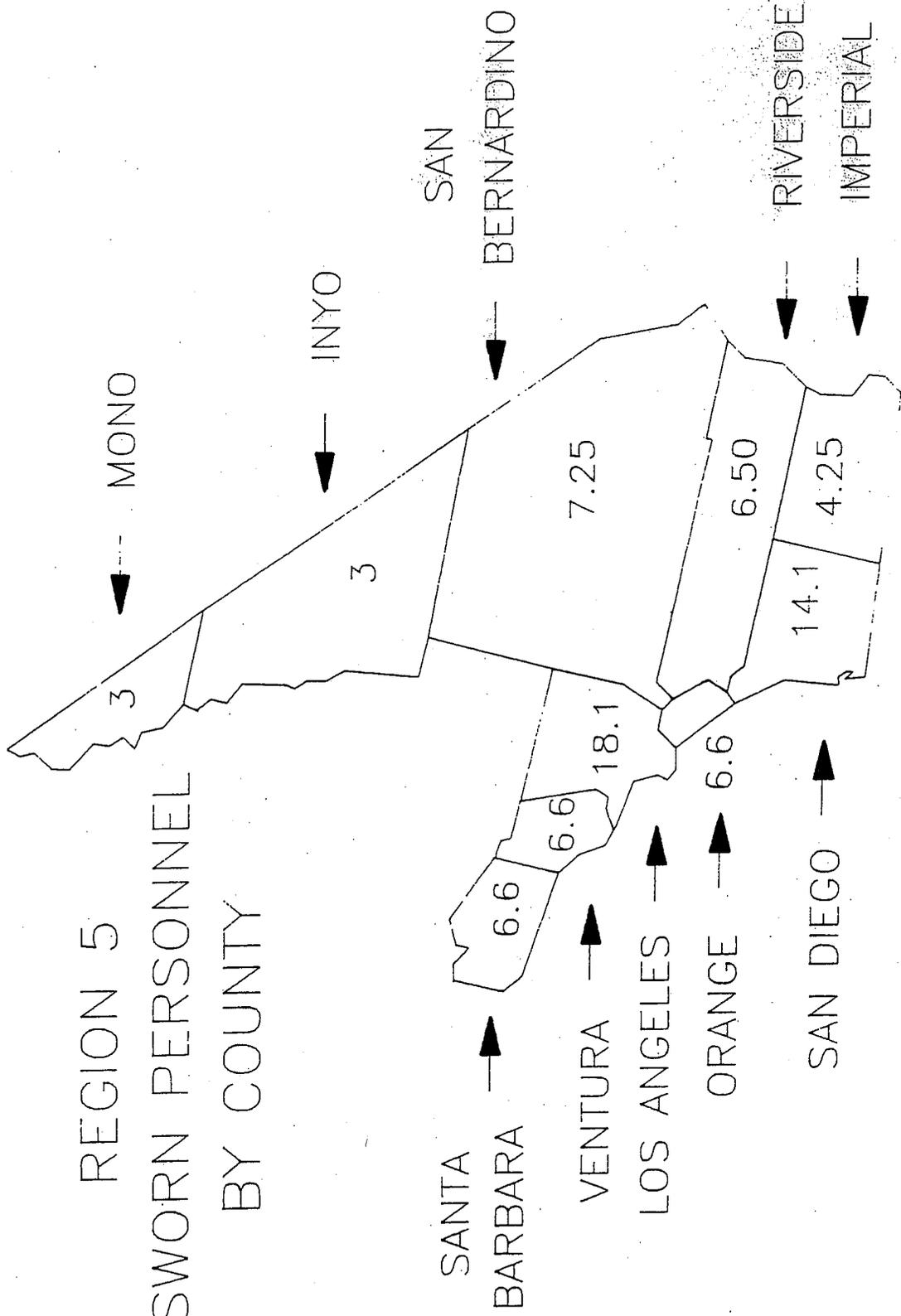


Table A1

"PASATAC ACTIVITY DESCRIPTION"

<u>CATEGORY</u>	<u>DESCRIPTION</u>
10	<u>UNCOMMITTED TIME</u> : GENERAL PATROL TIME IN THE FIELD LOOKING FOR VIOLATIONS, DETERRING VIOLATIONS. ONCE A VIOLATION IS NOTED OR CONTACT MADE, THIS TIME BECOMES COMMITTED TIME AND IS LOGGED INTO THE APPROPRIATE CATEGORY.
11	<u>SPORT PATROL AND RESPONSE</u> : PERTAINS TO THE SPORT USE OF A SPECIES DURING THE OPEN SEASON FOR THAT SPECIES.
12	<u>COMMERCIAL FISH AND WILDLIFE PROTECTION</u> : PERTAINS TO THE COMMERCIAL USE OF A SPECIES DURING THE OPEN SEASON FOR THAT SPECIES. DOES NOT INCLUDE ESTABLISHMENTS THAT ARE DEALING IN LIVE FISH AND WILDLIFE OR THEIR HIDES, FURS, PARTS, ETC. WHICH CANNOT LEGALLY BE SOLD COMMERCIALY.
13	<u>NON-SPORT/COMMERCIAL WILDLIFE PROTECTION</u> : DOES NOT PERTAIN TO SPORT OR COMMERCIAL USE, AS SPECIFIED IN CODES 10, 11 OR 12. USE THIS CODE FOR THE TAKE OF SPORT SPECIES DURING CLOSED SEASONS OR THE UNLAWFUL COMMERCIALIZATION OF SPORT SPECIES OR SPECIES THAT CANNOT BE TAKEN COMMERCIALY.
20	<u>S.O.U./MUTUAL AID</u> : SPECIAL INVESTIGATIONS BY S.O.U. TEAMS. ALSO, ASSISTANCE TO SPECIAL ENFORCEMENT TEAMS BY WARDENS. INCLUDES ASSISTANCE TO OTHER LAW ENFORCEMENT AGENCIES NOT DIRECTED TOWARD FISH AND GAME RESOURCES.
30	<u>LICENSE/PERMITS</u> : FOR FIELD OFFICERS, ALL ACTIVITY FOR SPECIAL PERMITS EXCEPT THOSE COVERED BY CATEGORY 50. EXAMPLES WOULD BE MEW INSPECTIONS FOR FALCONRY LICENSE APPLICANTS, INSPECTIONS FOR ISSUANCE OF PERMITS FOR LICENSED PHEASANT CLUBS, DOMESTICATED GAME BREEDERS, AQUACULTURE FACILITIES OR ANIMAL WELFARE FACILITIES.
40	<u>DEPREDAATION</u> : ALL ACTIVITIES PROVIDED TO INDIVIDUALS OR AGENCIES TO REDUCE DEPREDAATIONS, HEALTH HAZARDS OR NUISANCES CAUSED BY WILDLIFE.
50	<u>STREAMBEDS</u> : ALL ACTIVITIES RELATED TO THE DEVELOPMENT, ISSUANCE AND COMPLIANCE WITH STREAMBED ALTERATION AGREEMENTS. PROCESSING OF APPLICATIONS AND INSPECTION, MONITORING AND REPORTING.
60	<u>POLLUTION</u> : RESPONSE TO REPORTED SPILLAGE OR MISUSE OF TOXIC MATERIALS, INCLUDING PESTICIDES. INCLUDES INVESTIGATIONS, DATA COLLECTIONS OR ISSUANCE OF CITATIONS AND ANY FOLLOW-UP ACTIONS.
61	<u>SELF-INITIATED POLLUTION</u> : <u>DISCOVERY</u> OF SPILLAGE OR MISUSE OF TOXIC MATERIALS INCLUDING PESTICIDES. INCLUDES INVESTIGATIONS, DATA COLLECTIONS OR ISSUANCE OF CITATIONS AND ANY FOLLOW-UP ACTION.
70	<u>PUBLIC RESPONSE/HUNTER EDUCATION</u> : RESPONSE TO INFORMATION REQUESTS FROM THE PUBLIC AND MEDIA, ALSO PARTICIPATION OR ATTENDANCE AT MEETINGS OF ORGANIZATIONS OR GROUPS CONCERNING WILDLIFE RESOURCES OR THE COORDINATION OF A HUNTER SAFETY PROGRAM, INCLUDING RECRUITMENT AND TRAINING OF INSTRUCTORS. INCLUDES REQUIRED TIME TO BE SPENT ON HUNTER EDUCATION.
80	<u>TRAINING</u> : TRAINING PROVIDED BY DEPARTMENT PERSONNEL (OR OTHER STATE AGENCY), AND TRAINING PROVIDED BY COLLEGES, UNIVERSITY, PRIVATE COMPANIES OR BY FEDERAL OR LOCAL AGENCIES.
90	<u>ADMINISTRATION/MAINTENANCE</u> : GENERAL ADMINISTRATIVE ACTIVITIES. THIS INCLUDES PREPARING CORRESPONDENCES, MAKING PHONE CALLS, ATTENDING MEETINGS, CONFERENCES AND PREPARING "MONTH-END" AND OTHER MISCELLANEOUS ADMINISTRATIVE REPORTS. ALSO, MANAGEMENT, SUPERVISION, ALL CARE AND MAINTENANCE OF EQUIPMENT AND RADIOS; COORDINATION AND CLERICAL ACTIVITIES THAT CANNOT REASONABLY BE CODED TO OTHER CATEGORIES.
91	<u>COURT</u> : TIME SPENT IN COURT, INCLUDING TRAVEL TIME.

public services and resource protection becomes increasingly complicated in light of: 1) The vast spectrum of geographical diversity and varying human population densities; 2) Changing demographic and/or political considerations; 3) Seasonal, oceanic and other unexpected resource fluctuations; and, 4) Major differences in operational responsibilities. The implementation of this study represents an attempt to evaluate past efforts and current information to derive an objective, dynamic WPD personnel allocation and deployment criteria in Region 5. A related objective is to consider the potential to utilize the methodology in the other regions and/or functions in the Department.

3.0 METHODOLOGY SUMMARIZED

The California DFG has contributed historically to efforts in determining enforcement staffing levels and deployment options. Studies were conducted in 1954 and 1966 at the direction of the Legislature (Fullerton, 1966). Additional efforts were conducted to use workload information to better deploy and manage personnel in wildlife law enforcement in California (McCormick 1969, 1970). Administrators of other fish and wildlife resource organizations have sought a reliable criteria to more effectively distribute enforcement officers for many years (Giles, et al 1971; Morris, 1973; Bavin, 1976).

Traditional strategies used by urban police agencies are not solely the best methods available for determining fish and wildlife staffing or deployment needs. Urban police responsibilities are more focused and directed than those of fish and wildlife agencies. Wildlife crime levels are more difficult to measure as an index of personnel needs or deployment because the victim, i.e., wildlife, are unable to report violations. Therefore a combined strategy is needed to quantitatively measure or allocate workloads, ensure effective allocation of available resources, and for justifying any additional personnel.

The historic use of supervisory experience or intuition to evaluate and deploy WPD personnel has been questionable, even when supported by minimum artificial indicators such as license sales or user days. This method was used in the 1966 California Study (Fullerton, 1966) and proved to be unreliable. The 1966 methodology has little current application in light of ever increasing changes in the growth of California where greater impacts on fish and wildlife resources will require more effective protection. This protection is now dependent on more variable budgetary constraints and a better understanding of user group impacts.

The State of Missouri and the Alberta Fish and Wildlife Division, Alberta, Canada, employed several methods described by Cowles (1979) to determine personnel distribution. In addition, a police consultant, David Hobson of Manpower Needs Development

Company, has developed methodology to quantify workloads as a basis for establishing staffing levels in specified law enforcement units or geographic areas (Hobson, 1988).

Methodology for determining staffing levels is based on an identified enforcement need and divisional goal to provide a minimum of 25-35% undedicated (uncommitted) patrol time. This amount of time is recognized as being a realistic objective consistent with effective law enforcement practices in general. This amount of time provides proactive patrol opportunity which is vital to wildlife enforcement personnel in detecting violations which may otherwise go unnoticed.

The primary methodology for determining warden deployment in PASATAC was based on Cowles (1977; 1979); Melnyk and Smith (1987); and Glover (1987).

These methods described further in PARTS B and C, were applied to operational activities subject to documented goals of the Department and the Wildlife Protection Division. Specifically, the WPD goals are:

1. Improve internal WPD communications.
2. Increase the awareness of the general public of the Department's role and the importance of fish and wildlife issues placing emphasis on the importance of the warden force's mission in educating the public as well as enforcing regulations.
3. Increase emphasis on habitat protection by implementing a Streambed Alteration Team (SAT) program, by identifying land suitable for acquisition and increasing preventative patrols in oil spills and hazardous material areas.
4. Resolve vacancy problem with the Warden force and provide adequate staff capable of maintaining effective enforcement activities by establishing criteria for allocating staff based on an optimum of 35% of undedicated time, recruiting and assigning staff based on the criteria and adequately training and equipping staff, utilizing progressive equipment and techniques.
5. Establish long-term funding base for the Department through compliance and adequate staffing.
6. Emphasize marine/commercial activities through directed enforcement and constituent contacts.
7. Establish a comprehensive law enforcement computerized information system within WPD and integrate it with associated agencies within and outside the State.

Tables A2 and A3 summarize the historical studies oriented to staffing needs and deployment and highlight the methodologies utilized in PASATAC. Selection of these sources was based in part on information solicited from other State Fish and Game agencies. Figure A8 summarizes the results of these inquiries.

HISTORICAL STAFFING STUDIES

<u>YEAR</u>	<u>LOCATION AND AUTHOR(S)</u>
1954	CALIFORNIA BY DIRECTION OF LEGISLATURE
1966	CALIFORNIA BY DIRECTION OF LEGISLATURE
1969	CALIFORNIA BY MC CORMICK
1970	CALIFORNIA BY MC CORMICK
1971	V.P.I. BY GILES
1973	WILDLIFE MGT. INST. BY MORRIS
1976	USFWS BY BAVIN
1977	V.P.I. BY COWLES
1979	V.P.I. BY COWLES
1987	MISSOURI BY GLOVER
1987	ALBERTA, CANADA BY MELNYK & SMITH
1987	WISCONSIN BY DANIEL AND CHIZEK

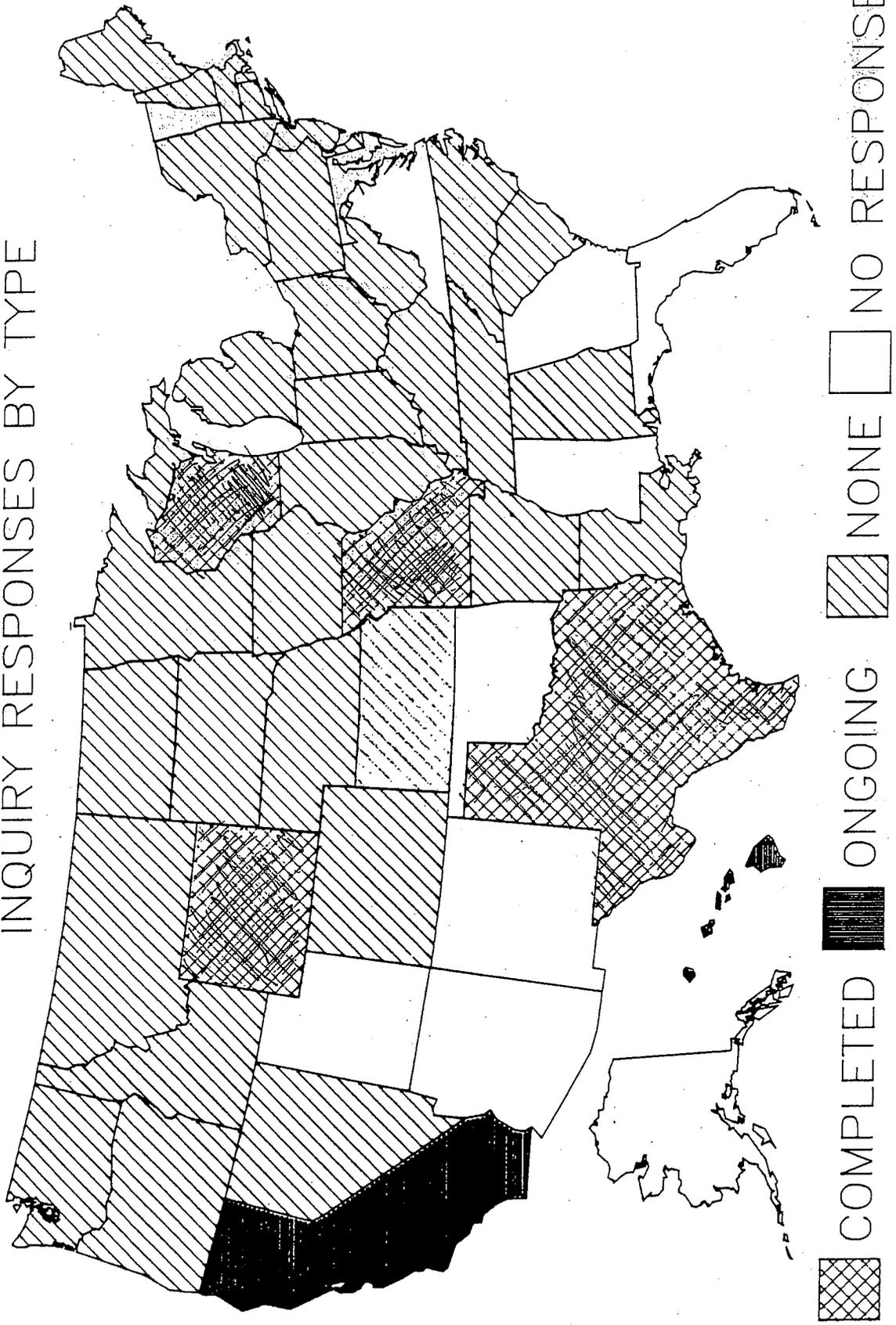
P A S A T A C

METHODOLOGY OBJECTIVES

- DEPLOYMENT
 - COWLES (1977;1979)
 - MELNYK AND SMITH (1987)
 - GLOVER (1987)
 - DANIEL AND CHIZEK (1987)

- STAFFING LEVELS
 - IDENTIFIED ENFORCEMENT NEED
 - DIVISIONAL GOAL OF 25% - 35% UNDEDICATED
OR "UNCOMMITTED" PATROL TIME
 - HOBSON (1988)

STAFFING AND DEPLOYMENT STUDIES IN THE U.S.
INQUIRY RESPONSES BY TYPE



PART B

METHODS FOR DETERMINING STAFF LEVELS

David Hobson of Manpower Needs Development Company, Denver, Colorado, provided the method of using the identified goals and activities to measure and predict staffing levels and personnel deployment. Cowles' method emphasizes deployment of given personnel levels, whereas Hobson calculates personnel needs based on enforcement goals/priorities and identified workload activities in specific geographic areas. Hobson's methods are more in line with traditional enforcement agency staffing studies used to determine need rather than deployment. The key element in his method involves determining the actual time available for undedicated enforcement as an agency objective to accomplish defined goals. The operational objective in WPD is to maintain between 25% and 35% undedicated time.

The Steering Committee reviewed current position statements, geographic distribution, workload levels, demographics and resource demands. This resulted in selection of a representative sample of Region 5 sworn field personnel to utilize in providing PASATAC workload data. The Steering Committee determined that the 38 positions selected were representative of the region as a whole. Position numbers selected were:

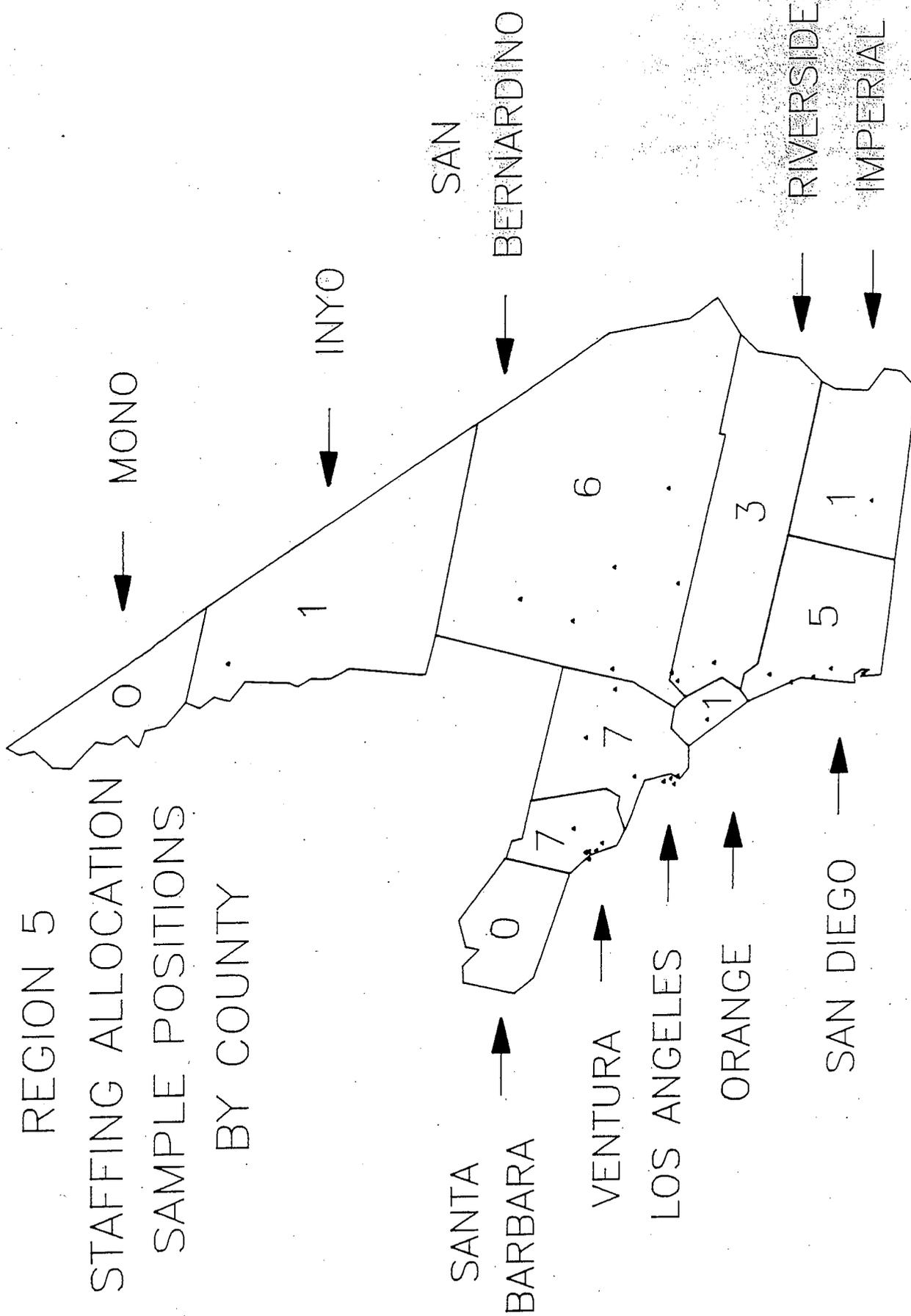
566-358-8418-016	566-358-8421-064	566-358-8412-005
566-358-8421-047	566-358-8421-061	566-358-8418-002
566-358-8421-022	566-358-8421-037	566-358-8421-039
566-358-8421-016	566-358-8421-057	566-358-8421-029
566-358-8421-065	566-358-8418-015	566-358-8421-015
566-358-8421-074	566-358-8416-001	566-358-8421-007
566-358-8416-003	566-358-8421-024	566-358-8418-006
566-358-8421-056	566-358-8418-014	566-358-8421-053
566-358-8421-014	566-358-8421-063	566-358-8421-049
566-358-8412-003	566-358-8418-008	566-358-8418-003
566-358-8421-025	566-358-8421-020	566-358-8421-001
566-358-8421-041	566-358-8421-048	566-358-8421-010
566-358-8421-051	566-358-8421-008	

Figure B1 shows regional distribution of sample allocation personnel (S.A.P.) by county. Since Hobson's methodology is based on "field level workload", only 31 positions were used in the final analysis. The other positions, which included two Captains, were evaluated outside the main study criteria as an index to their activities during the study period. The further reduction was created by vacancies which developed in previously selected positions during the study period. These vacancies were generally distributed throughout the region. The Steering Committee determined that the absence of these positions would not radically change the overall workload data.

REGION 5

STAFFING ALLOCATION
SAMPLE POSITIONS

BY COUNTY



A form was used to log actual time spent on all activities and categorizing this workload into defined groups (Figures B2 and B3). The new log was used for a 90-day period to provide base line data for Hobson's analysis. The amount of actual time available for each field position is controlled by Department policy, State and Federal law and collective bargaining contracts. The California State Administrative Manual (1987), Section 8740 (Figure B4), lists the amount of time the average worker has available in a year reduced by computed averages of holiday, vacation, sick leave, etc.

**STATE ADMINISTRATIVE MANUAL
MISCELLANEOUS ACCOUNTING PROCEDURES**

BILLING FOR SERVICES OF EMPLOYEES PAID ON MONTHLY BASIS (REVISED 11/87) 8740

Below is the formula for determining hourly rates when departments bill for services of employees paid on a monthly basis on or after July 1, 1987. The formula provides an amount for holidays, vacations, sick leave, informal time off, bereavement, jury duty leave, military leave, and State contribution for staff benefits; therefore, departments will bill only for those hours actually worked. However, the formula does not include an amount for such costs as identifiable operating expenses incurred in rendering the service, charges for other than incidental use of equipment, overhead, and other costs. Such costs will be included in billing for services in accordance with SAM Sections 8752.1 and 8758.

TOTAL TIME FOR CALENDAR YEAR	365 days x 8 hours	2,920 hrs
DEDUCTIONS		
SUNDAYS	52 x 8 hrs	416 hrs
SATURDAYS	52 x 8 hrs	416 hrs
Holidays:		
January 1	1	2nd Monday in October
3rd Monday in January	1	November 11
February 12	1	Thanksgiving Day
3rd Monday in February	1	November 27
Last Monday in May	1	December 25
July 4	1	Floating Holiday
1st Monday in September	1	
	13.0 x 8 =	104 hrs
Vacation Earned (average)	15.96 x 8 =	127.7
Sick Leave Taken (average)**	8.6 x 8 =	68.8
Bereavement (average)		2.0
Informal Time Off	0.5 x 8 =	4.0
Jury Duty Taken (average)		2.7
Military Leave Taken (average)		1.2
TOTAL DEDUCTIONS (Hours)		1,142.74
Total Actual Working Time Per Year (Hours)		1,777.26
Total Actual Working Time Per Month (Hours)		148.11

* Workers' Compensation, Industrial Disability, Unemployment Compensation, and Life Insurance benefits are not included as factors in the formula for computing hourly billing rates in this section since such expenses can vary substantially among departments. Departments, however, will include Workers' Compensation, Industrial Disability, Unemployment Compensation, and Life Insurance benefits in billing for services in accordance with SAM Sections 8752.1 and 8758.

** This is a statewide average rate for all full-time civil service employees based on statistics compiled and released by the Department of Personnel Administration. If a department's vacation earned or sick leave experience is significantly different than that used here and it regularly bills for services, it should substitute the number of hours representing its experience.

222.2 Days - Full OR 18.5 Days per month

FIGURE B4

PART C

METHODS FOR DETERMINING STAFF DEPLOYMENT

A program was developed to allocate manpower among Region 5's ten (10) counties based on need. The program was based on a model originally proposed by C.J. Cowles (1977, 1979) and used in numerous states in recent years.

The modeling process consisted of the following steps. Department goals were listed and weighted based on their importance to the department. Enforcement activities were also listed and weighted based on their importance towards accomplishing each departmental goal. Activities were given overall ranks to ensure that activities vital for accomplishing key goals secured higher priorities than activities tangential to the key goals. Indices were selected to represent the workload of each activity in each county. All of the information was synthesized and processed to ensure that manpower was distributed relative to the workload in each county for each activity, and weighted by the importance of each activity.

For example, if monitoring marine fisheries was a more important goal than habitat improvement, commercial patrol would most likely be weighted more heavily than streambed alteration. We could look at indices of commercial patrol such as commercial marine licenses on a county by county basis. We could also look at the number of streambed alterations on a county by county basis. A county with a large commercial fishing fleet would be given more manpower than a county with a large number of streambed alterations in this scenario. A county with a moderate number of both may come out somewhere in-between.

For this study the goals of the Wildlife Protection Division were used (See PART A). They were assumed to be weighted equally in terms of their importance. This can easily be changed as needed in the future.

The fourteen major activities are listed and defined in Table A1. Table C1 shows the specific activities used in this model. The following six activities were not used in the analysis and were eliminated from the original fourteen activities: 1) Uncommitted Patrol Time was not used because the only way to measure this activity was through the actual time recorded on the daily activity logs and it has been established as a fixed index of 25-35% of available time; 2) The Special Operations Unit/Mutual Aid category was eliminated because it is officer dependent and the volume of past SOU/Mutual Aid activity is not a good indicator of present workload; 3) Self-Initiated Pollution Investigations was eliminated as a separate category and was combined with the Pollution Activity category; 4) Training was eliminated from the

The average net time available for one field enforcement officer (warden) per year may be referred to as Planning Availability (PA) which when compared to committed activity time (CA), will be used to calculate the time for uncommitted enforcement (UCT) for an individual field position. The estimated number of personnel years (PYs) necessary to achieve work objectives, including mandated and optimum activities, such as the 25-35% uncommitted time allowance, may be determined by:

$$UPT = PA - CA$$

THE GOAL IS
 $UPT = 25\% \text{ TO } 35\% \text{ OF PA}$

WHERE: UPT = UNCOMMITTED PATROL TIME

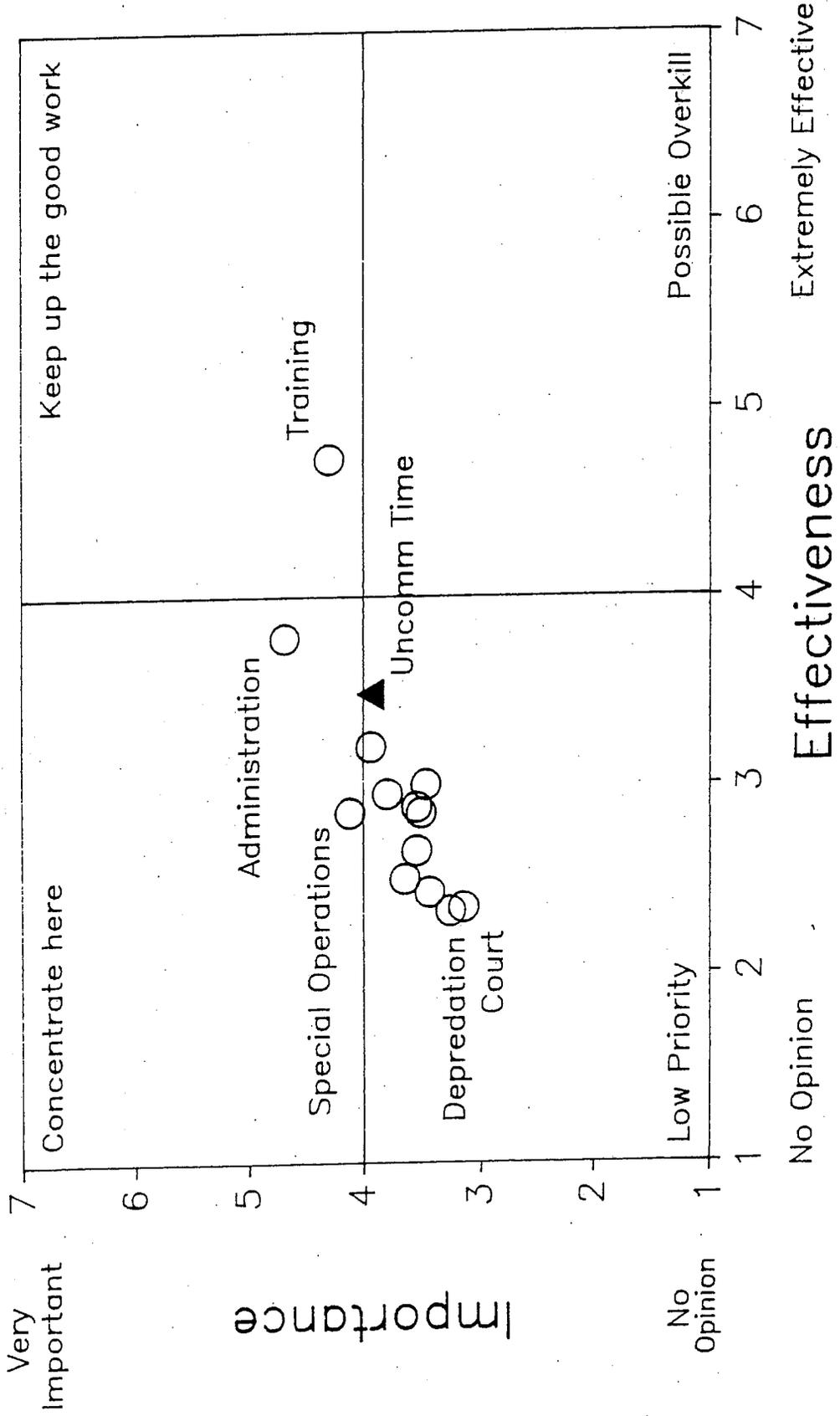
PA = PLANNING AVAILABILITY

CA = COMMITTED ACTIVITY

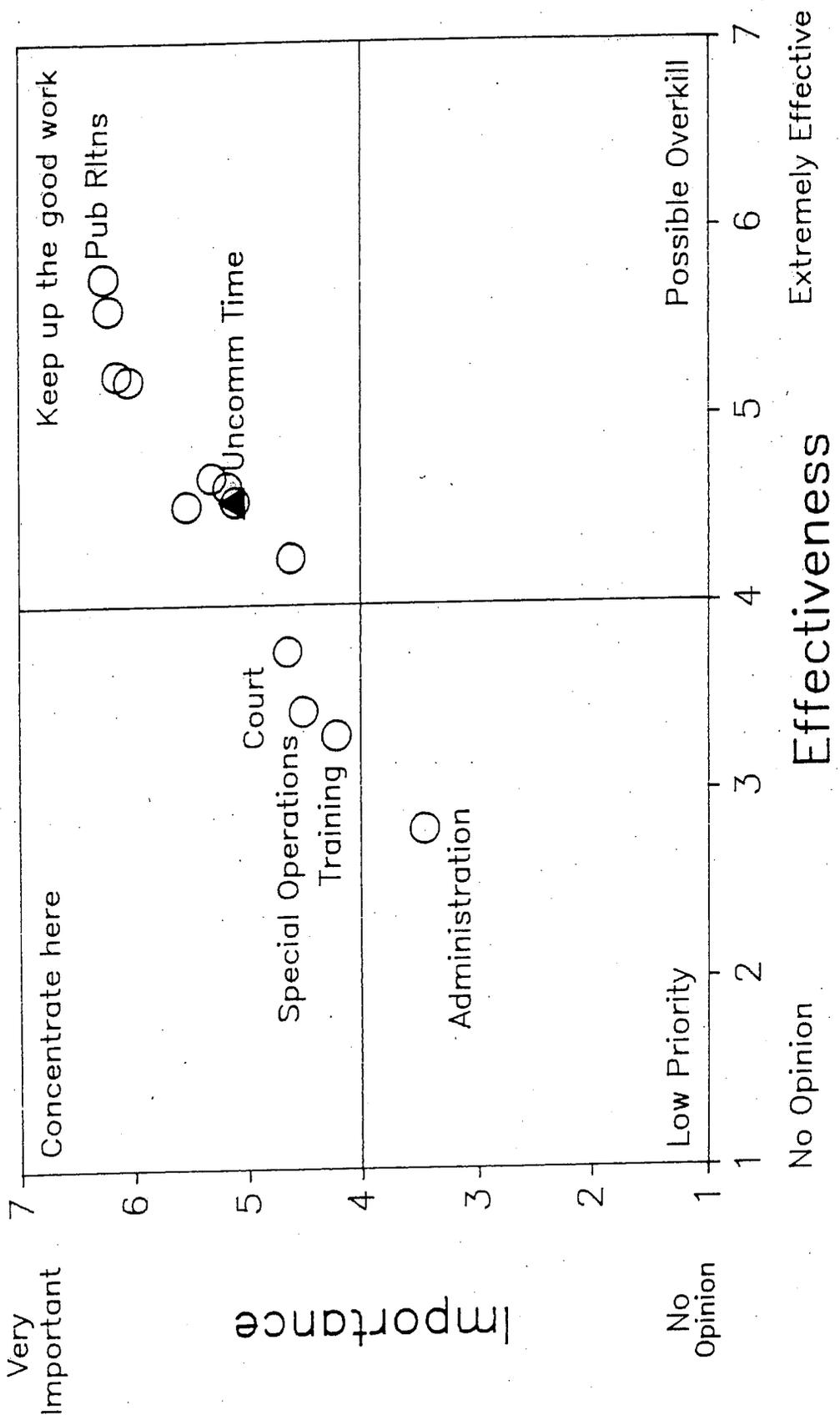
TABLE C1

	<u>Measurement Index</u>	<u>Abbreviation</u>
1.	Sport Patrol and Response	SPR
	a. Total sport fishing licenses sold	TSFL
	b. Total sport hunting licenses sold	TSHL
	c. Total number of Hunter Safety students	THSS
	d. Acreage of standing water	LAKE
	e. Mileage of fishable streams	STRM
	f. Area in acres of trout planted waters	TRTA
	g. Area in miles of trout planted waters	TRTM
	h. Number of marinas, launch ramps, pleasure boats	BTLN
	i. Waterfowl areas plus wildlife areas	WWA
	j. Native harvest - game	NGH
	k. Native harvest - fish	NFH
	l. Sport case violation locations	SVL
	m. Area of State controlled waters	AOW
2.	Commercial Wildlife Protection	CWP
	a. Total commercial license sales	TCLS
	b. Total number of commercial fish businesses (fish markets/restaurants)	TDMR
	c. Total number of bobcats	TBC
	d. Total commercial landings	FL
	e. Total number of commercial vessels	TCV
	f. Total imported fish tonnage by land and sea	TIFT
	g. Area of ocean water to 200 miles	AFOW
	h. Commercial violation locations	CVL
3.	Non-Sport Commercial Patrol	NSCP
	a. Area of rare, threatened and endangered plants and animals	RTE
	b. Ecological Reserves	DSC
	c. Miles of stream closures	SC
	d. Number of pet shots	PS
	e. Number of people utilizing Ports of Entry	POE
	f. Non sport/commercial violation locations	NSCL
4.	Licenses and Permits	LAP
	a. Number of animal welfare permits	AWP
	b. Number of gold dredgers	GD
	c. Number of scientific collectors	SC
	d. Falconry	FALC
5.	Depredation and Nuisance	DAN
	a. Number of depredation tags	TDT
	b. Number of nuisance calls	TNN
	c. Total area under agriculture	AIA
6.	Streambed Alterations - Number of agreements	SBA
7.	Pollution Enforcement	PA
	a. Number of pollution instances	NPOL
8.	Hunter Education/Public Relations	HEPR
	a. Number of Hunter Safety instructors	THE
	b. Population densities	POP
	c. Percentage of school-age population	SPOD

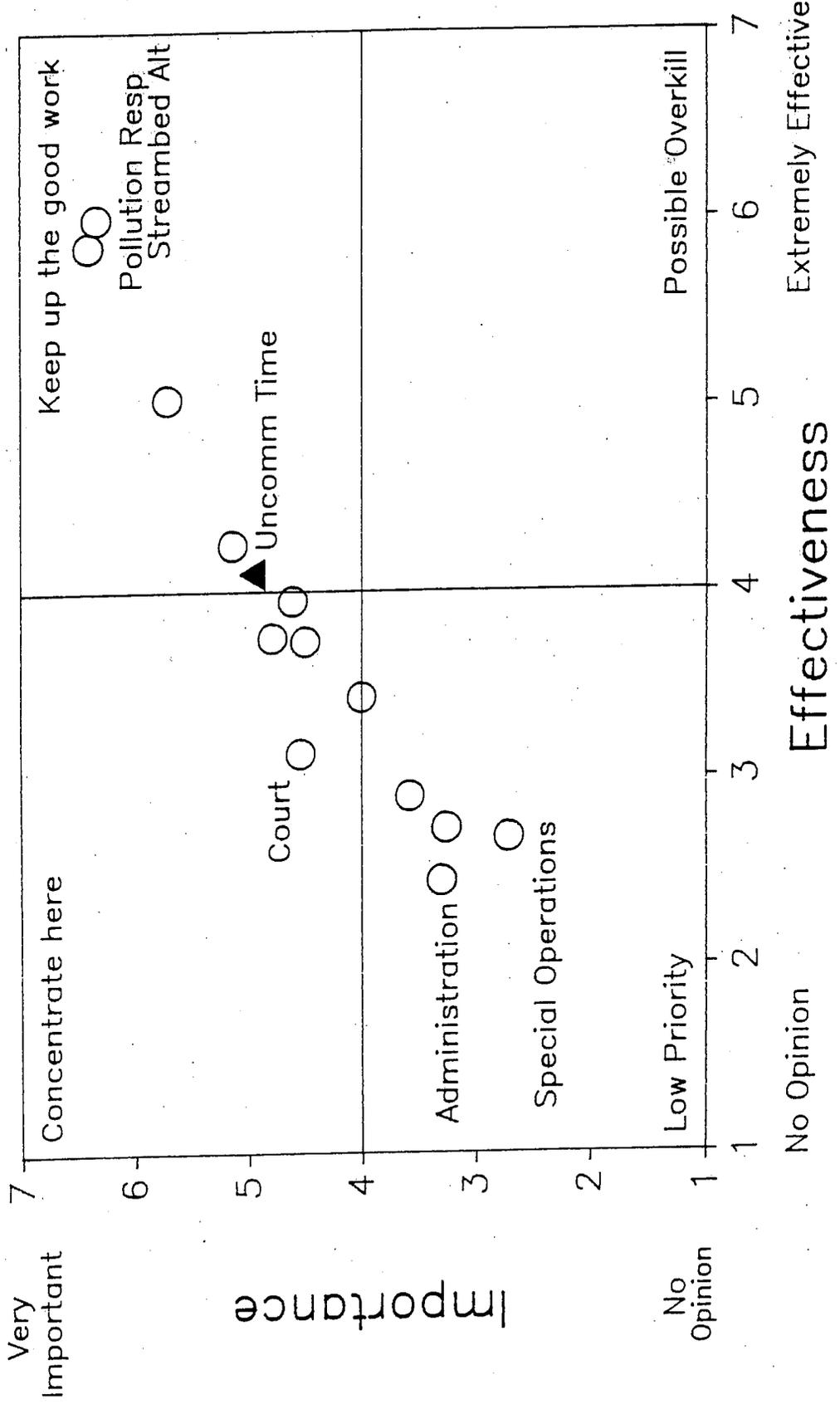
The Impact of Activities on Improving Communications



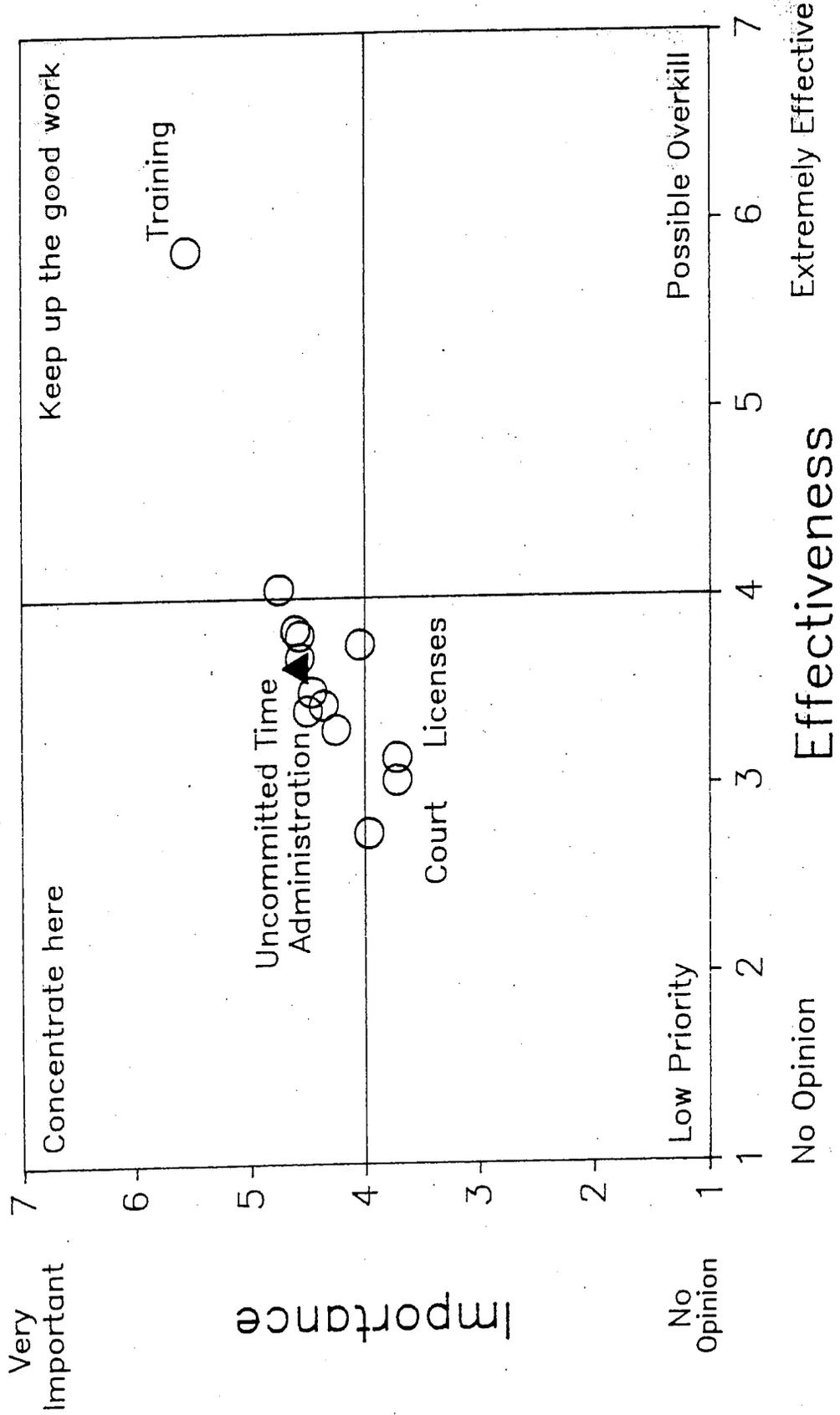
The Impact of Activities on Improving Public Awareness



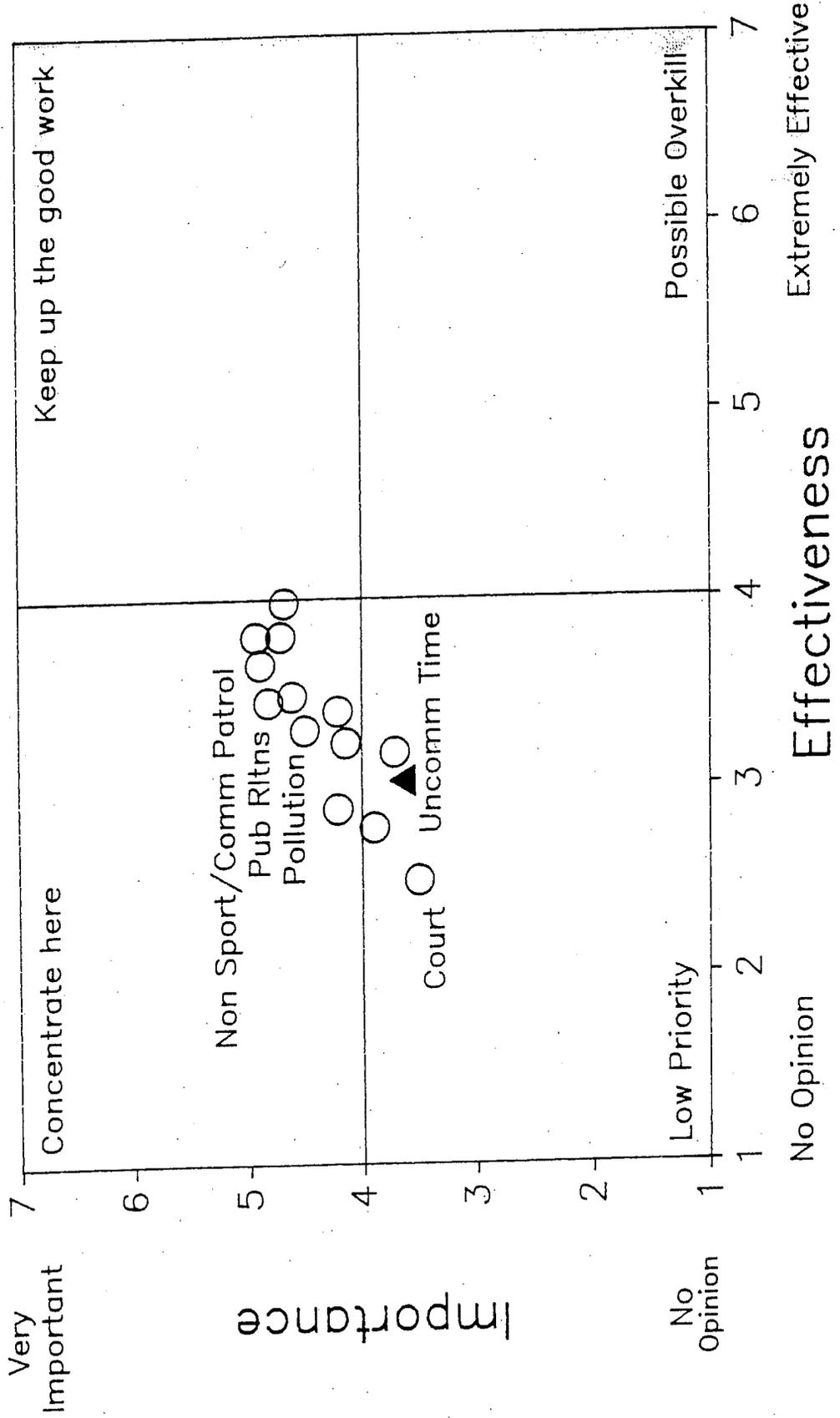
The Impact of Activities on Improving Habitat Protection



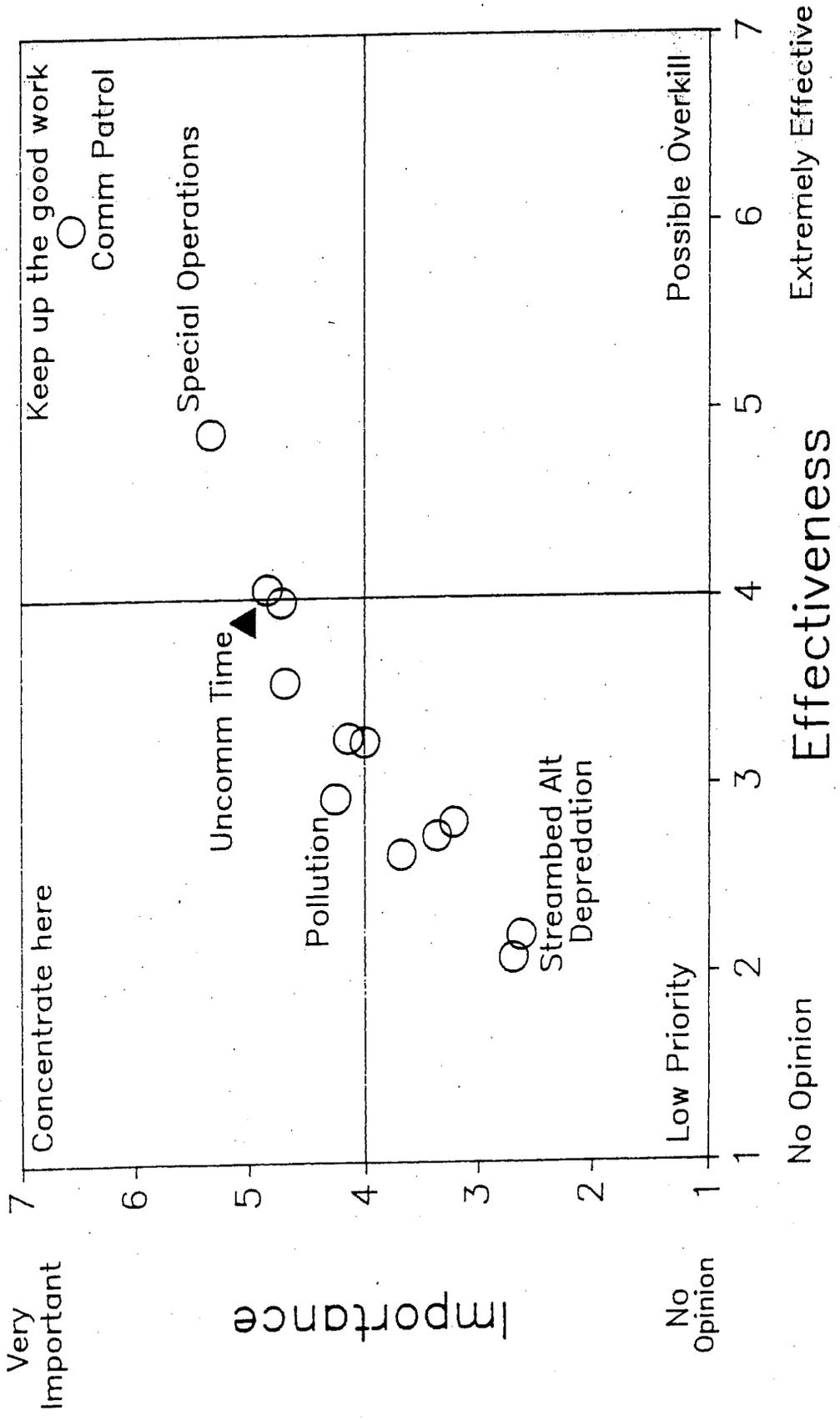
The Impact of Activities on Improving Staff Adequacy



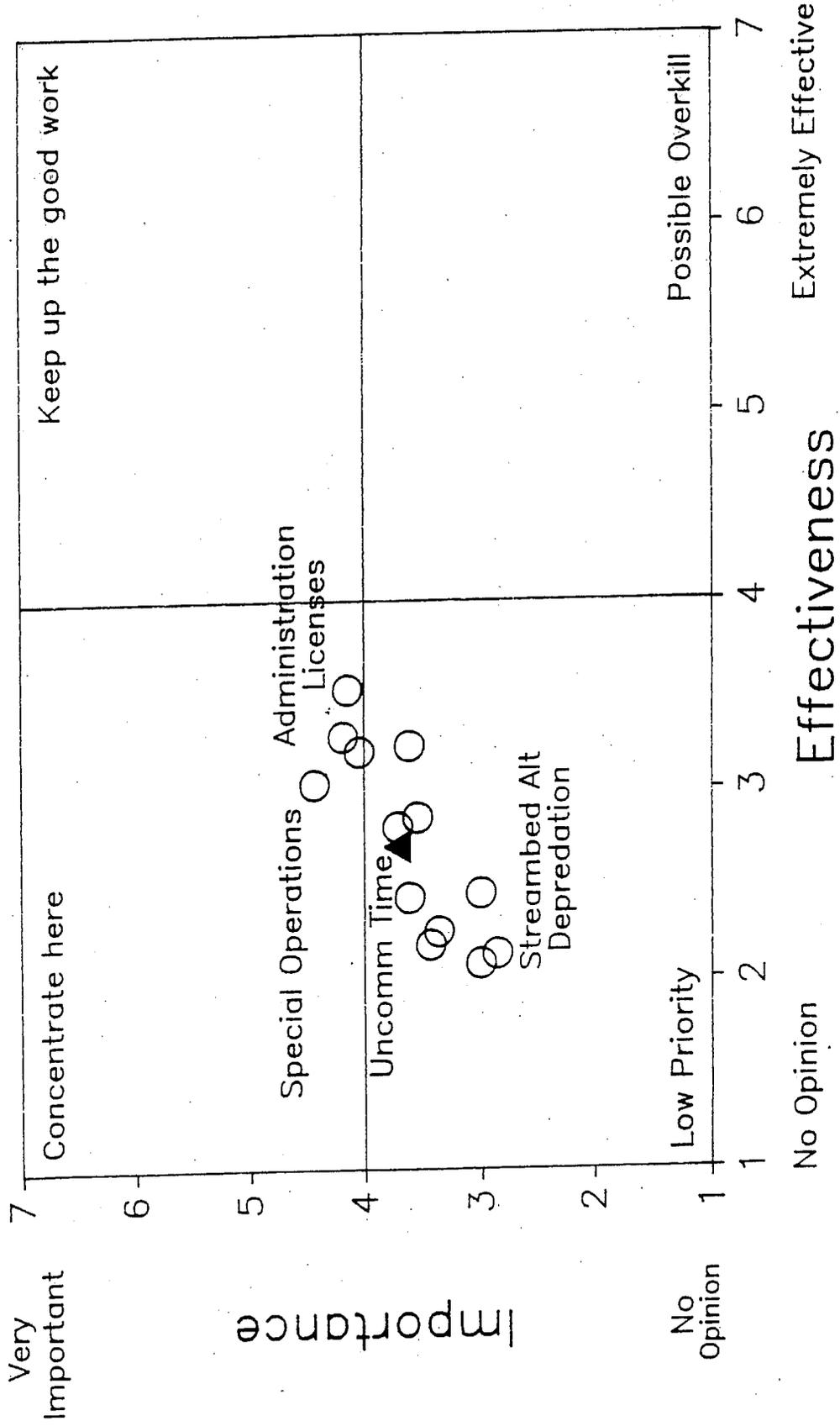
The Impact of Activities on Improving Long Term Funding



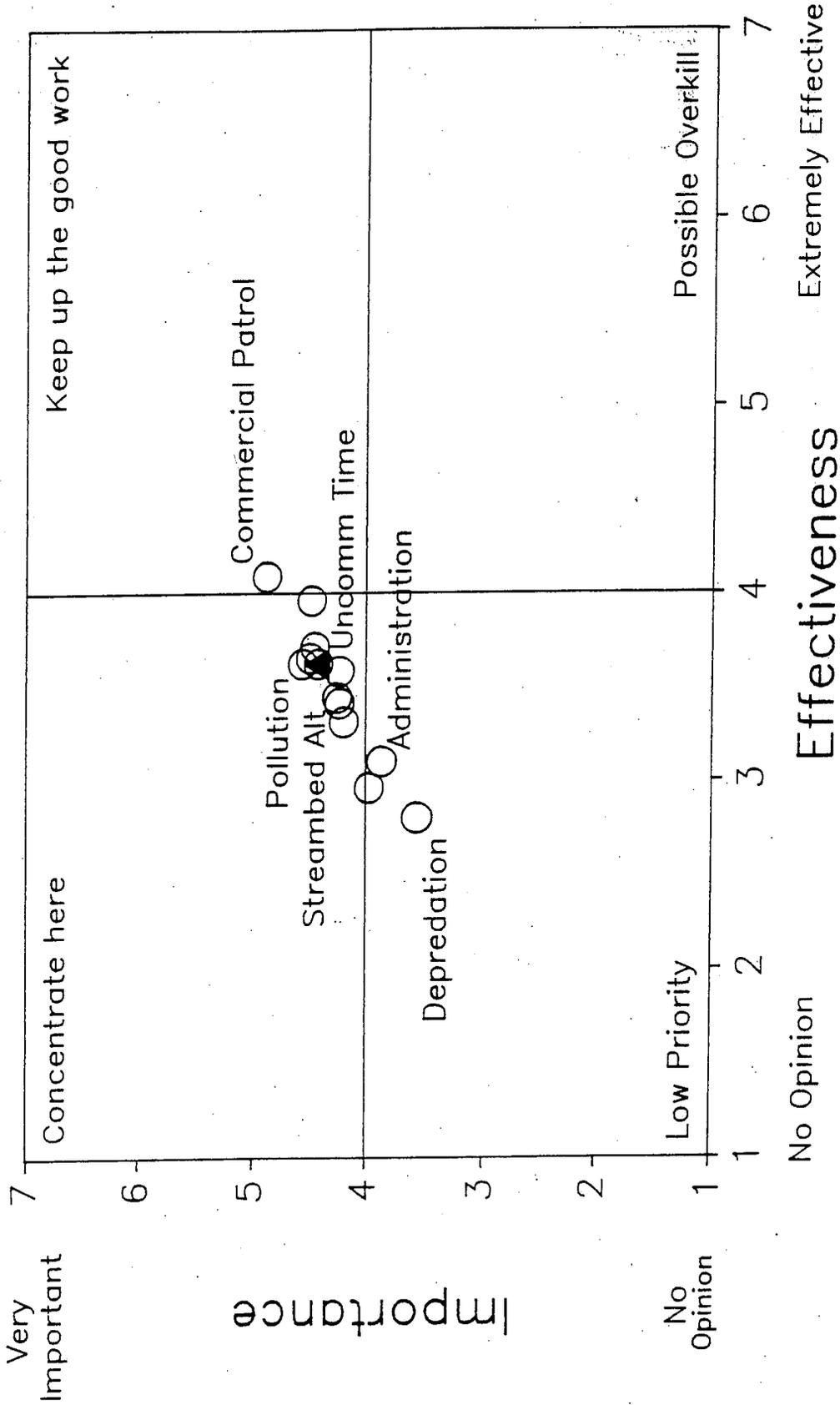
The Impact of Activities on Emphasizing Marine/Commercial Activities



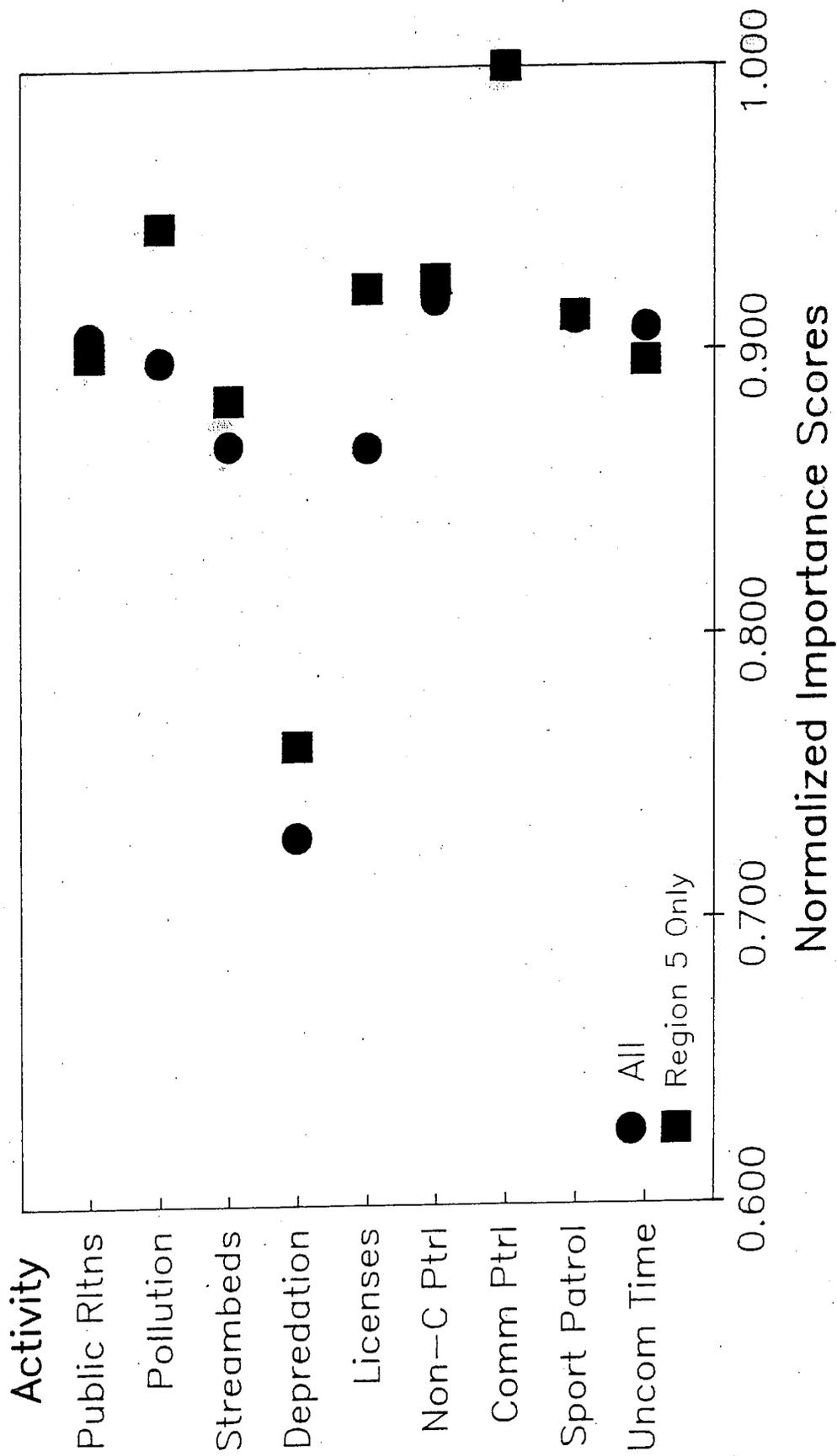
The Impact of Activities on Establishing Computerized Info System



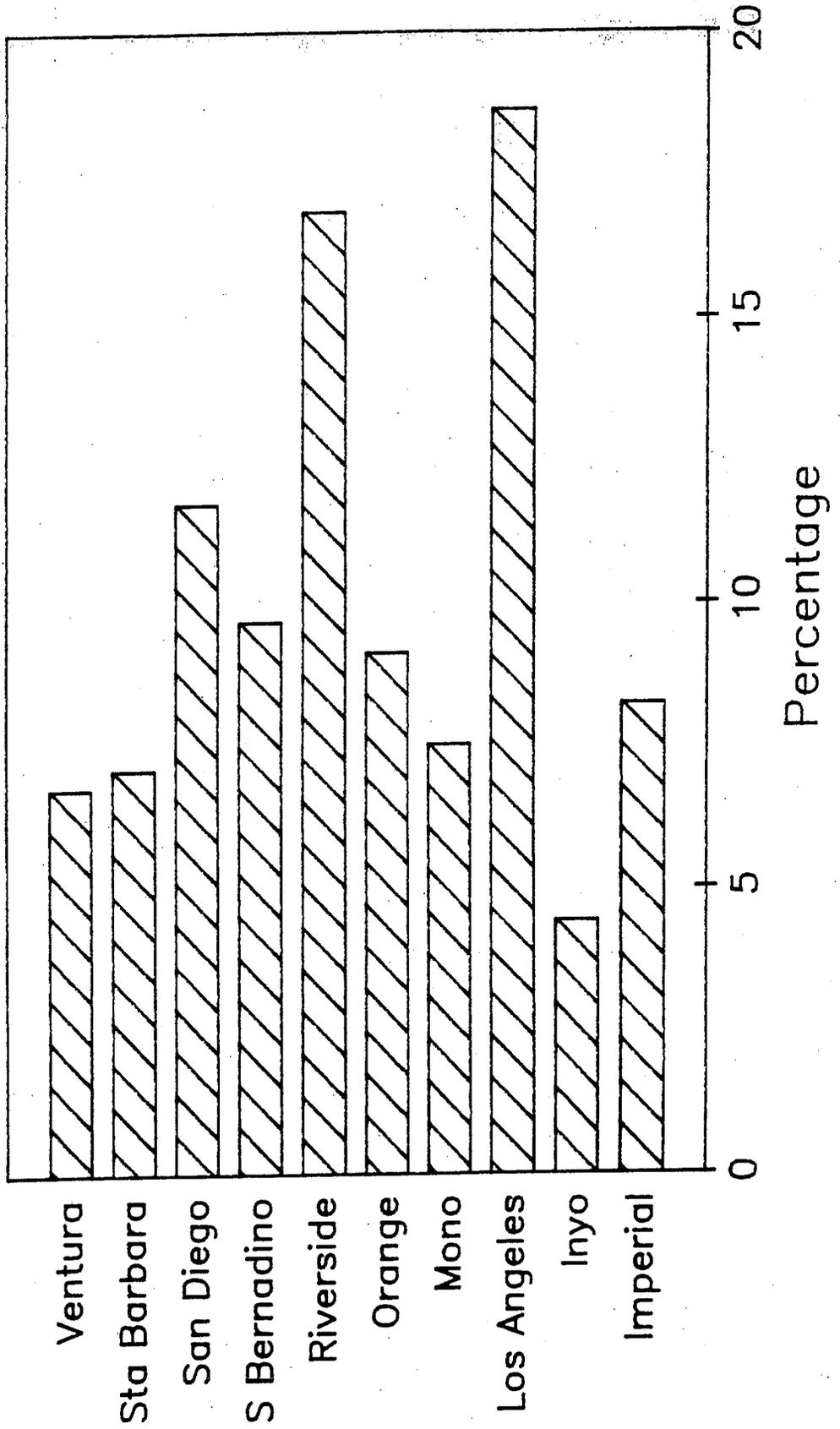
The Impact of Activities on All Department Goals Overall



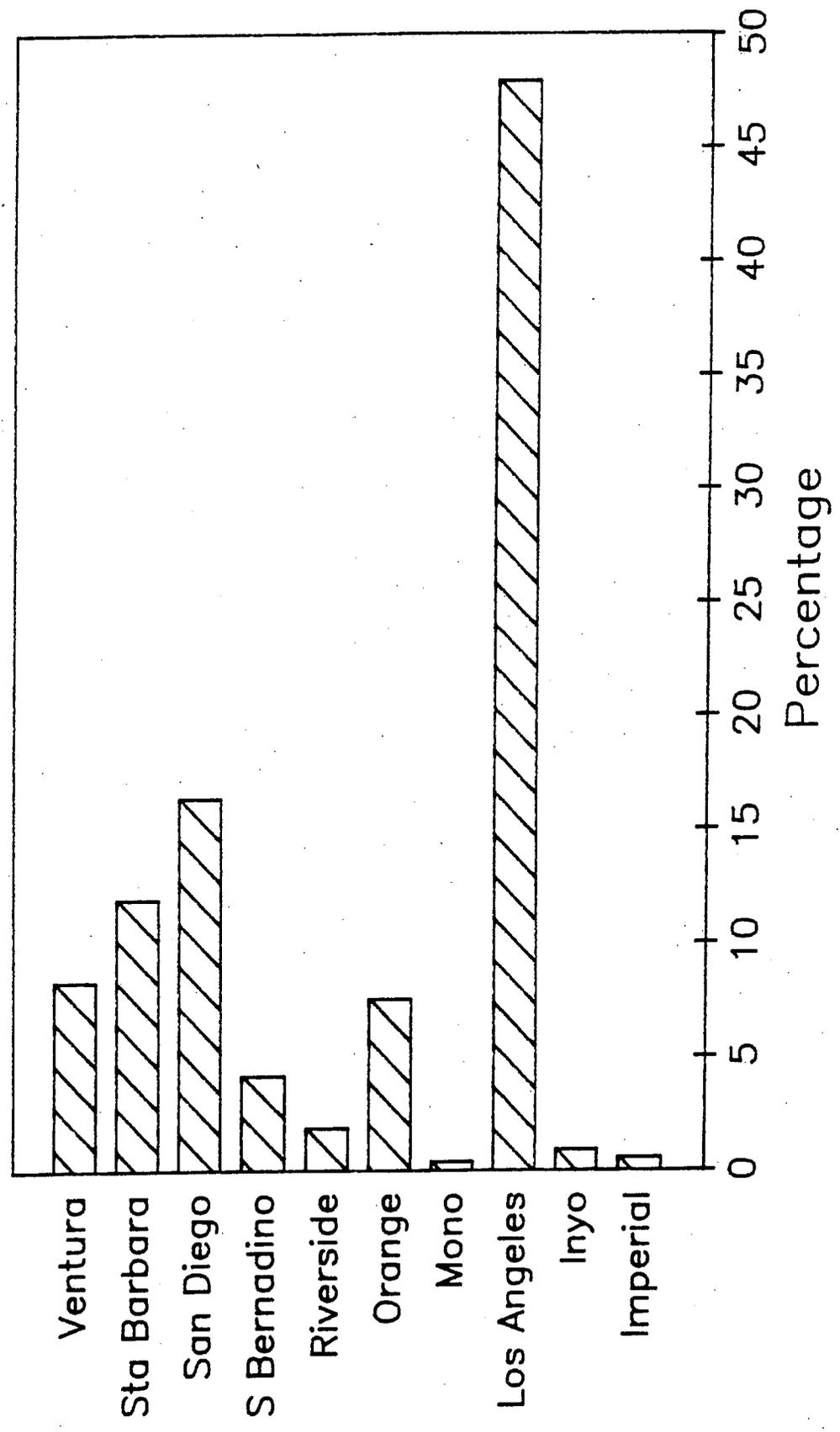
The Relative Importance of Each Activity



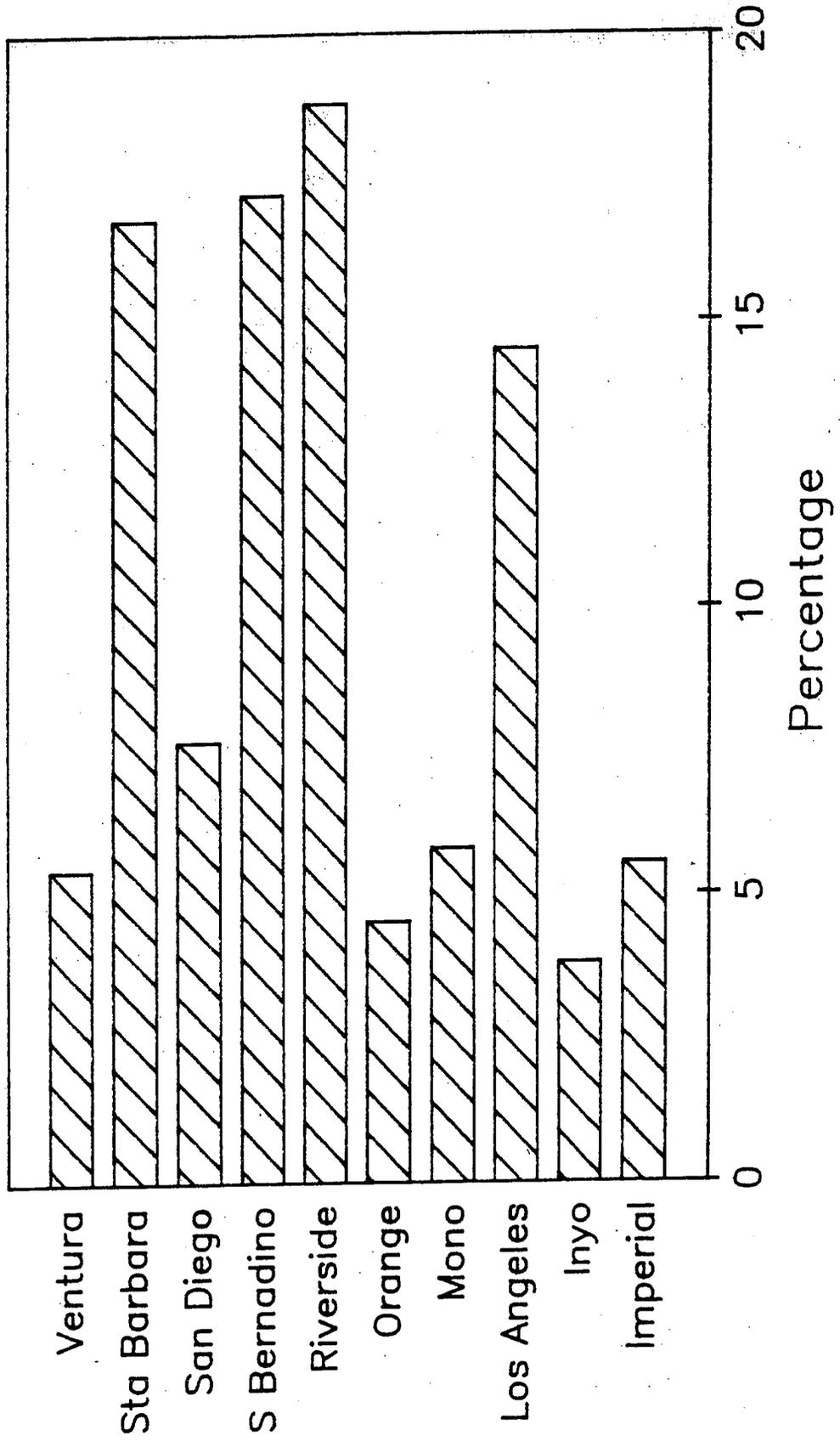
Percentage Of Activity by County Sport Patrol and Response



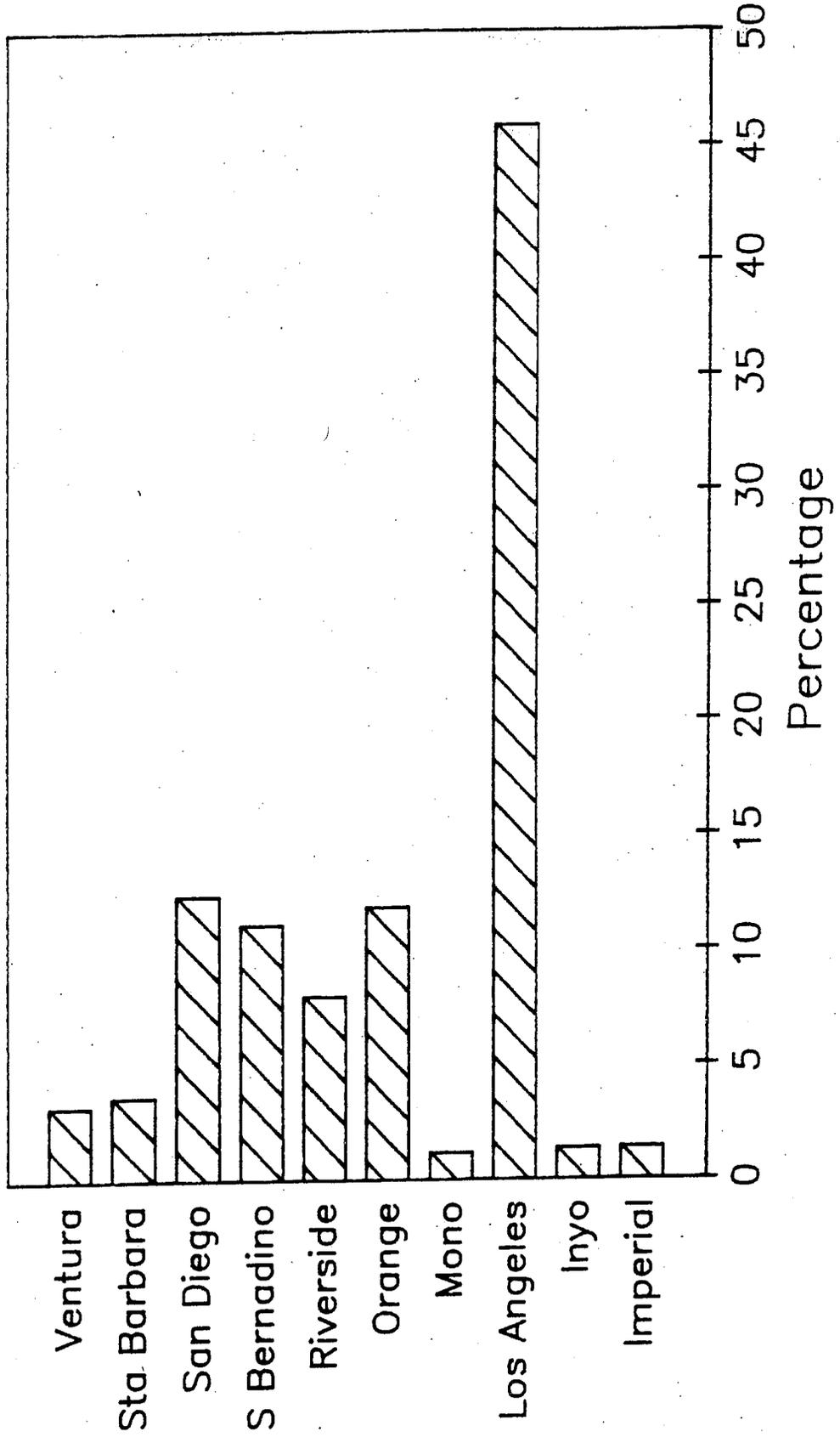
Percentage Of Activity by County Commercial Patrol and Response



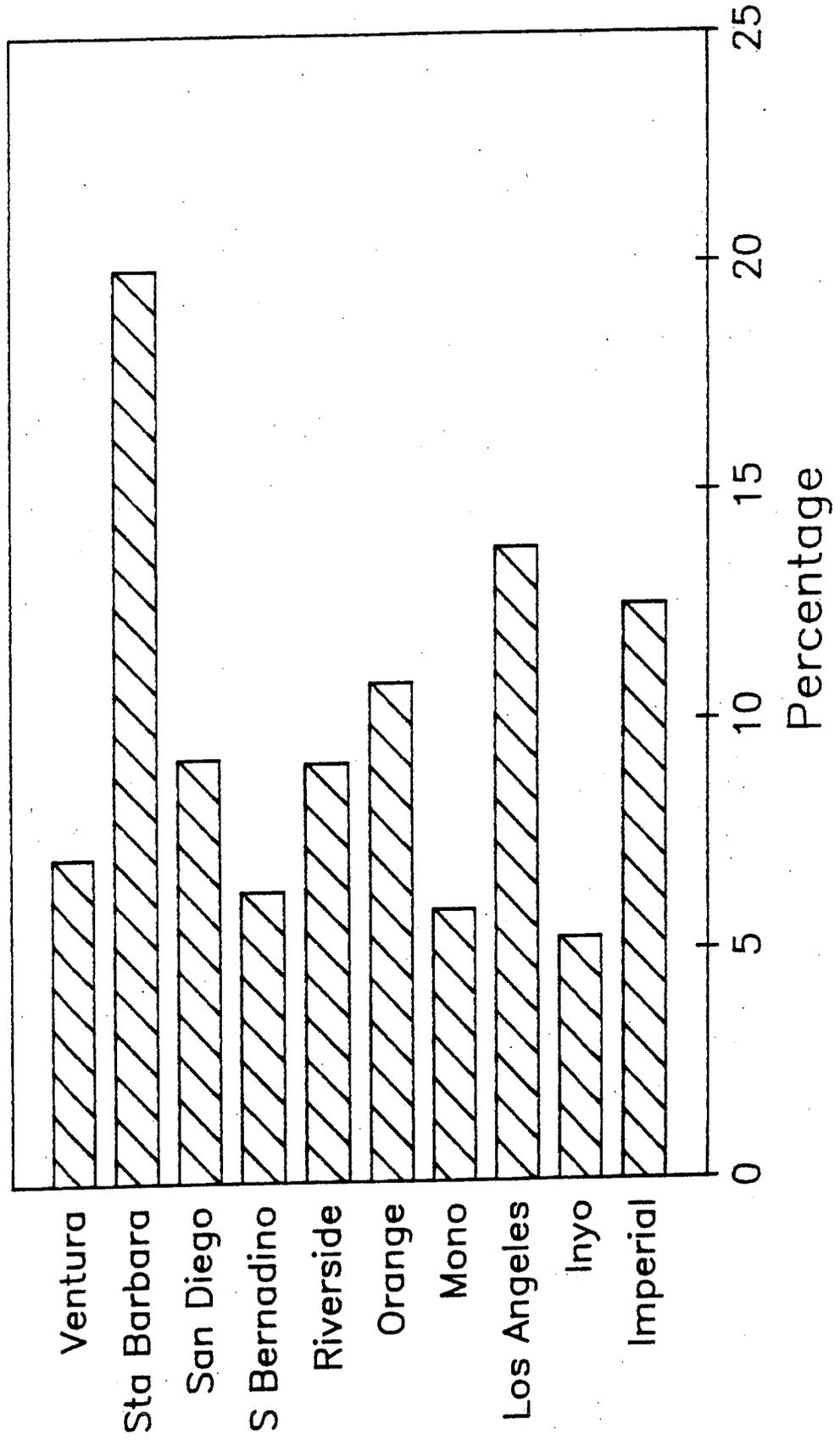
Percentage Of Activity by County Non Sport/Comm Patrol and Response



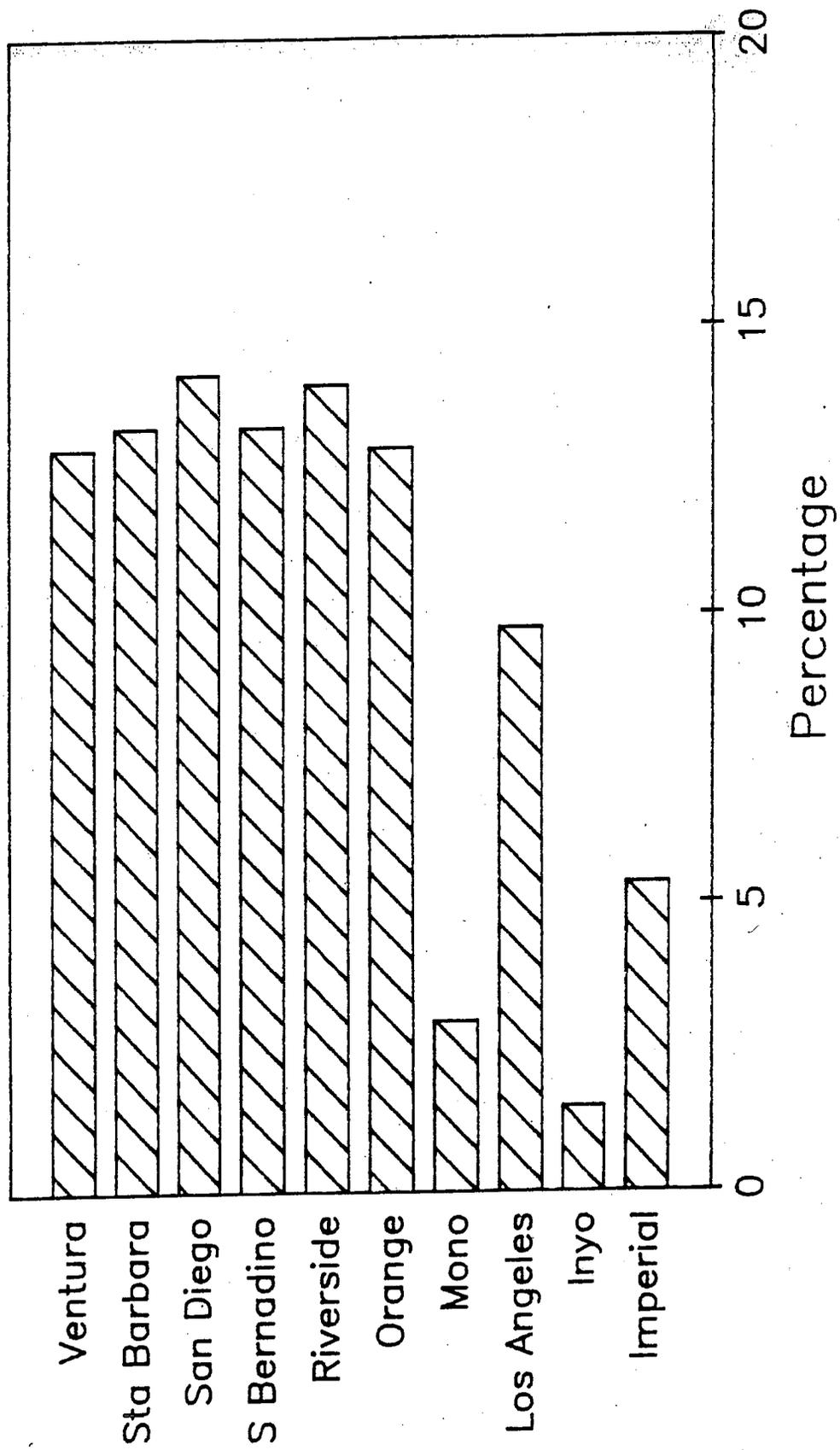
Percentage Of Activity by County Licenses and Permits



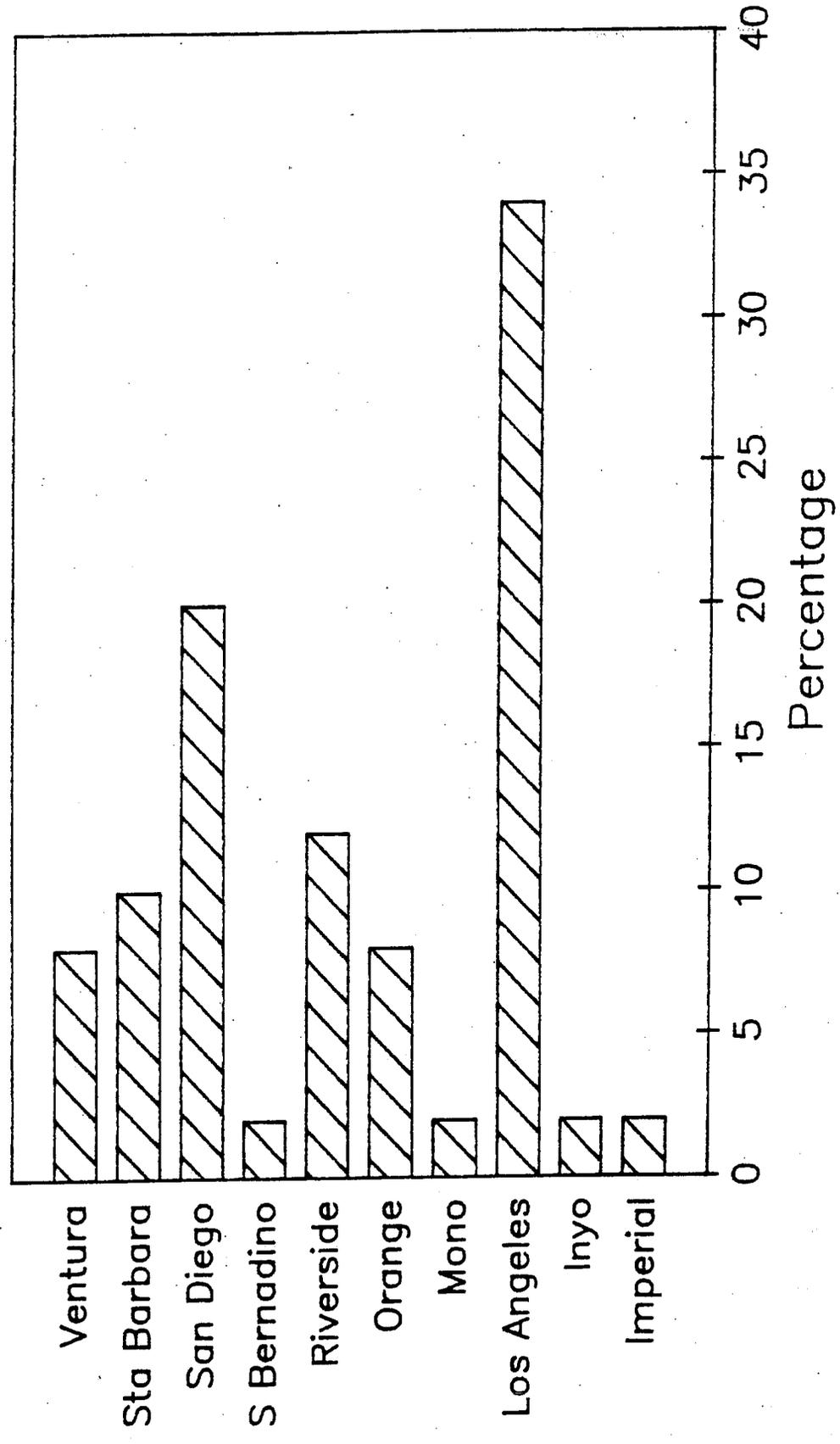
Percentage Of Activity by County Depredation and Nuisance Calls



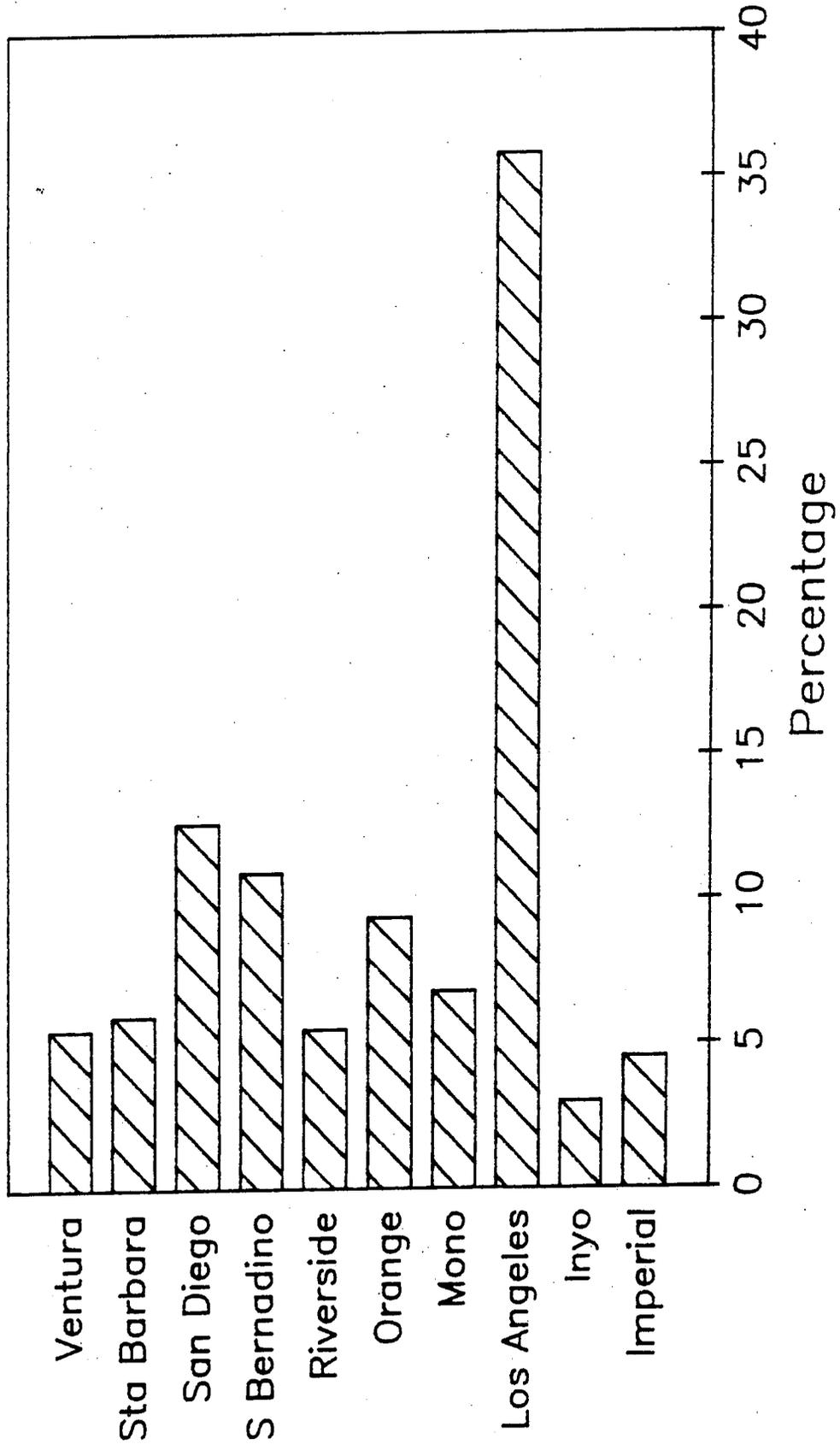
Percentage Of Activity by County Streambed Alterations



Percentage Of Activity by County Pollution



Percentage Of Activity by County Public Response / Hunter Education



analysis in the R5/WLP phase of PASATAC because it is fairly constant within the region. This activity should be considered when evaluating statewide/inter-regional data in the expanded phase of PASATAC; 5) Administration/Maintenance was not used because it was concluded that it accounted for a constant amount of workload on a per warden basis; 6) Court Time was not used as a separate activity but was incorporated into the appropriate sport, commercial or non-sport/commercial categories.

Two surveys were conducted to weight the importance of each activity in accomplishing each of the WPD goals. One survey was conducted among the supervisory and management staff of the Department. Another survey was conducted among the Region 5 Patrol Captains. The results of the two surveys are listed in Figures C1 thru C8.

For each survey the average importance of each activity was calculated across departmental goals. The largest average importance was divided into all average importance values to scale the values to a maximum of 1.00. After scaling, a great similarity between the results of the two surveys was apparent (Figure C9). This shows an important agreement in priorities among Department upper level management.

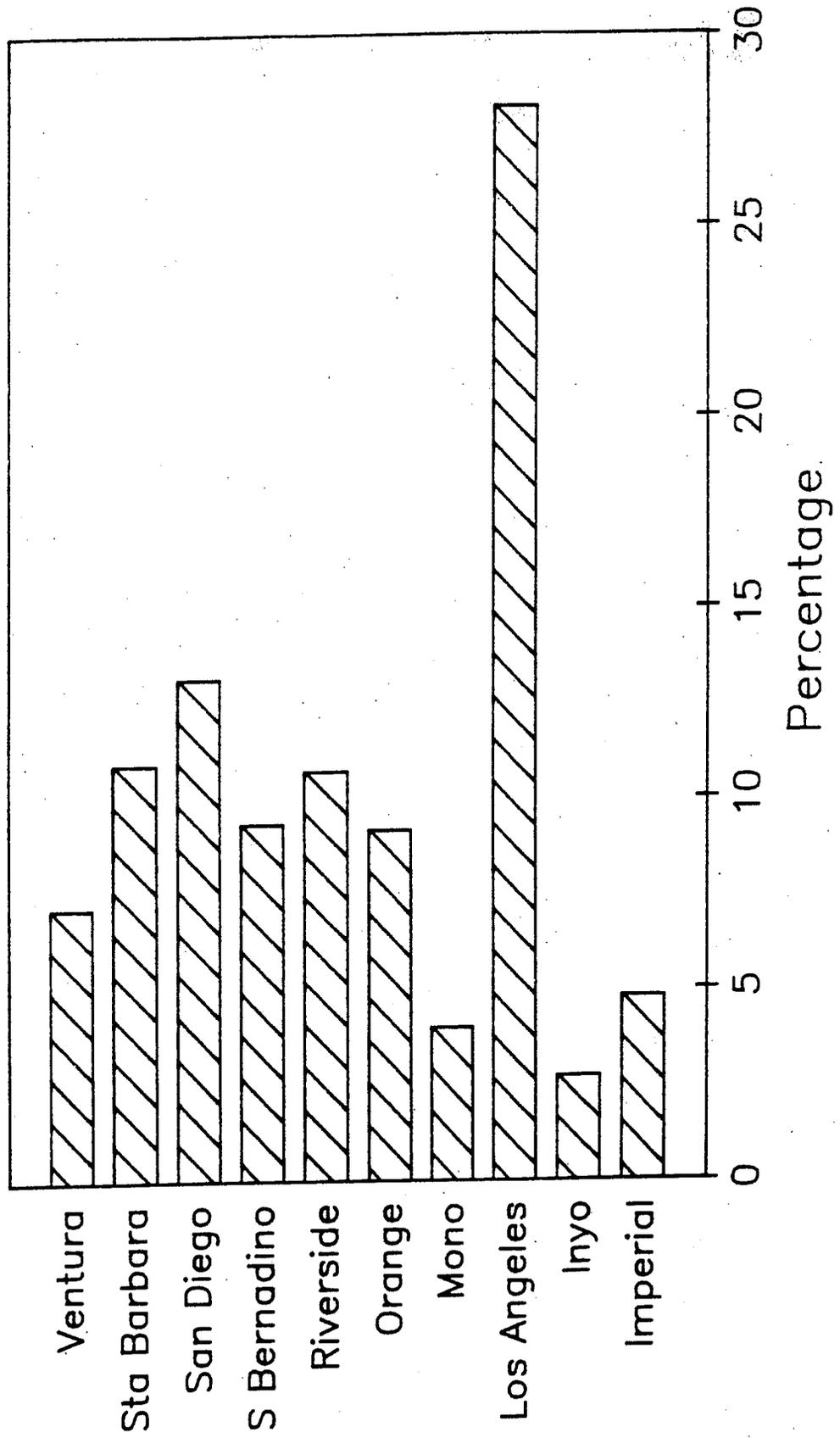
Next indices were selected to represent the relative workload of each activity on a county by county basis (Table C1). Some of the activities had one suitable index, and other activities required multiple indices to indicate the workload of each activity. For each index, proportions were calculated from the total of the index, it's proportion was 0.40. These proportions were averaged across indices for each activity. If an activity had a number of indices, the final county index was just an average of the county's proportions across all indices. If an activity had one index, the final county index was just the proportion of the total of that index that occurred in that county.

All of the information was now available for the final calculations. A relative importance of each activity had been calculated. The proportion of work in each county had also been calculated on a county by county basis. The proportions by county (Figures C10 to C17) were multiplied by their corresponding importance values then divided by the sum of the importance values. This produced a column of percentages that represented the appropriate manpower distribution as follows:

Manpower Allocation by County (Figure C18)

Imperial	0.048	4.8
Inyo	0.027	2.7
Los Angeles	0.281	28.1
Mono	0.040	4.0

Percentage Of Manpower
by County

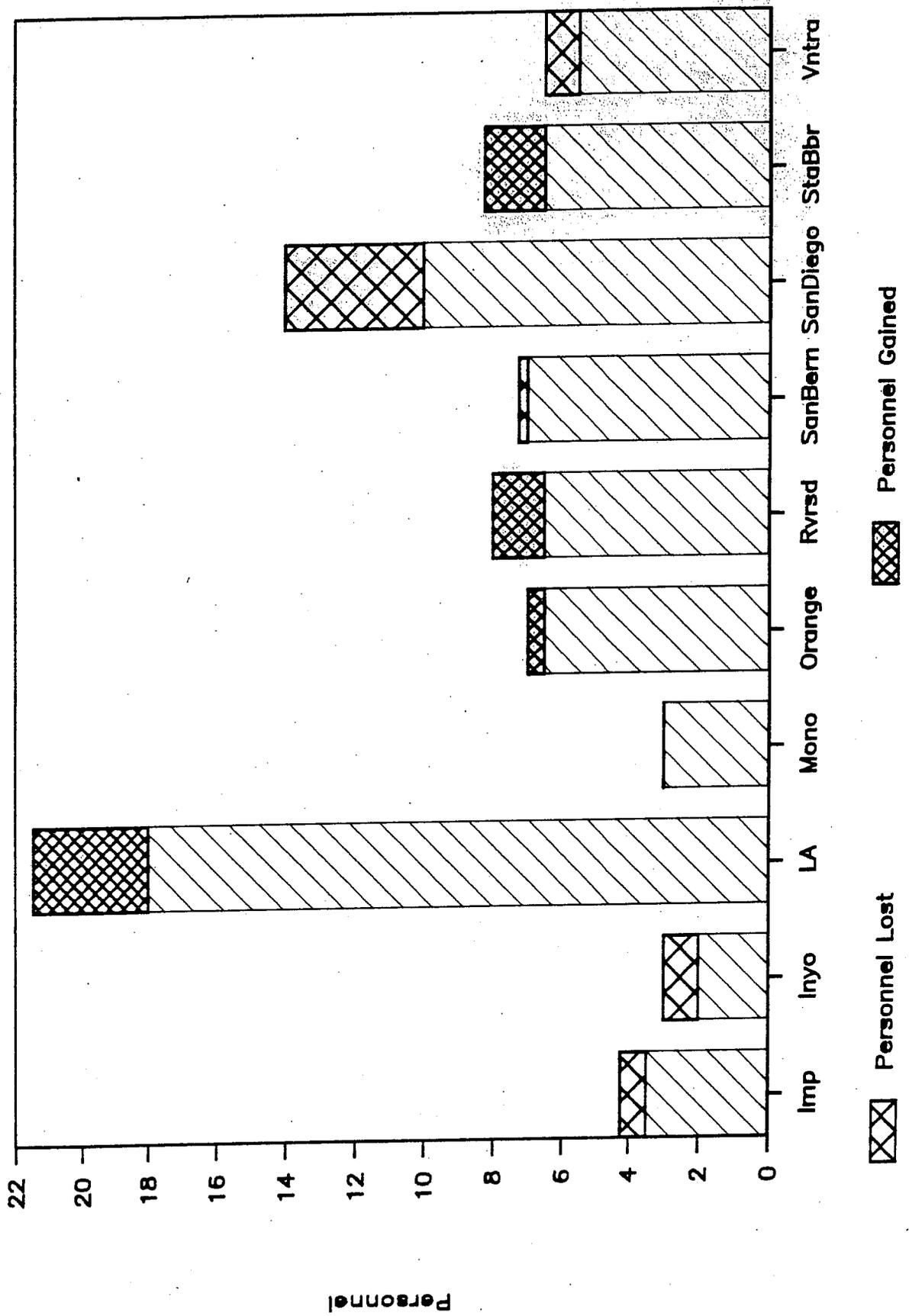


Orange	0.092	9.2
Riverside	0.107	10.7
San Bernardino	0.093	9.3
San Diego	0.131	13.1
Santa Barbara	0.109	10.9
Ventura	0.072	7.2

Once the number of available enforcement personnel was determined, the total number was multiplied by the percentages to distribute the manpower among counties in the most effective way. The current personnel deployment in R5 shown in Figure A7.

Current and adjusted personnel deployment allocations are demonstrated by Figure (F19). This process was also utilized to determine deployment of additional positions determined by the staffing needs assessment described in part B of this study. The results of the analysis of data and projected staffing levels and deployment are described in part D, Analysis and Conclusions.

Current & Adjusted Personnel by County



PART D

ANALYSIS AND CONCLUSIONS

1.0 Application of 1966 Criteria to Current Workload and Staff Levels

Options for determining staffing needs may include use of the criteria presented in the 1966 study (Fullerton, 1966). This criteria may be applied using the recommended 4% growth factor per year and a twelve-hour work day. The results of this growth based on 1963 as a base (198 wardens) are shown in Figure D1. Converting the twelve-hour day to a more conventional eight-hour day presents a more graphic increase. With FLSA restrictions as they are and other mandates, such as training an eight-hour day is more realistic. The resulting increases are shown in Figure D2. Figures D1 and D2 also show the increases predicted for Region 5 based on the same 4% per year increase using comparable starting staff levels for the ten counties in the region. This includes the positions previously allocated to the Marine Region which fall within Region 5's boundaries (54 positions).

Based on this study alone, Region 5 would need somewhere between 75 and 100 additional field enforcement positions using a twelve-hour day. Converting to an eight-hour day, this would mean between 100 and 150 additional positions.

2.0 Determining Staff Levels

The goal of this work is to determine the number of additional personnel required to increase uncommitted patrol time (UCT) to 35% without decreasing the current amount of time spent on other WPD activities.

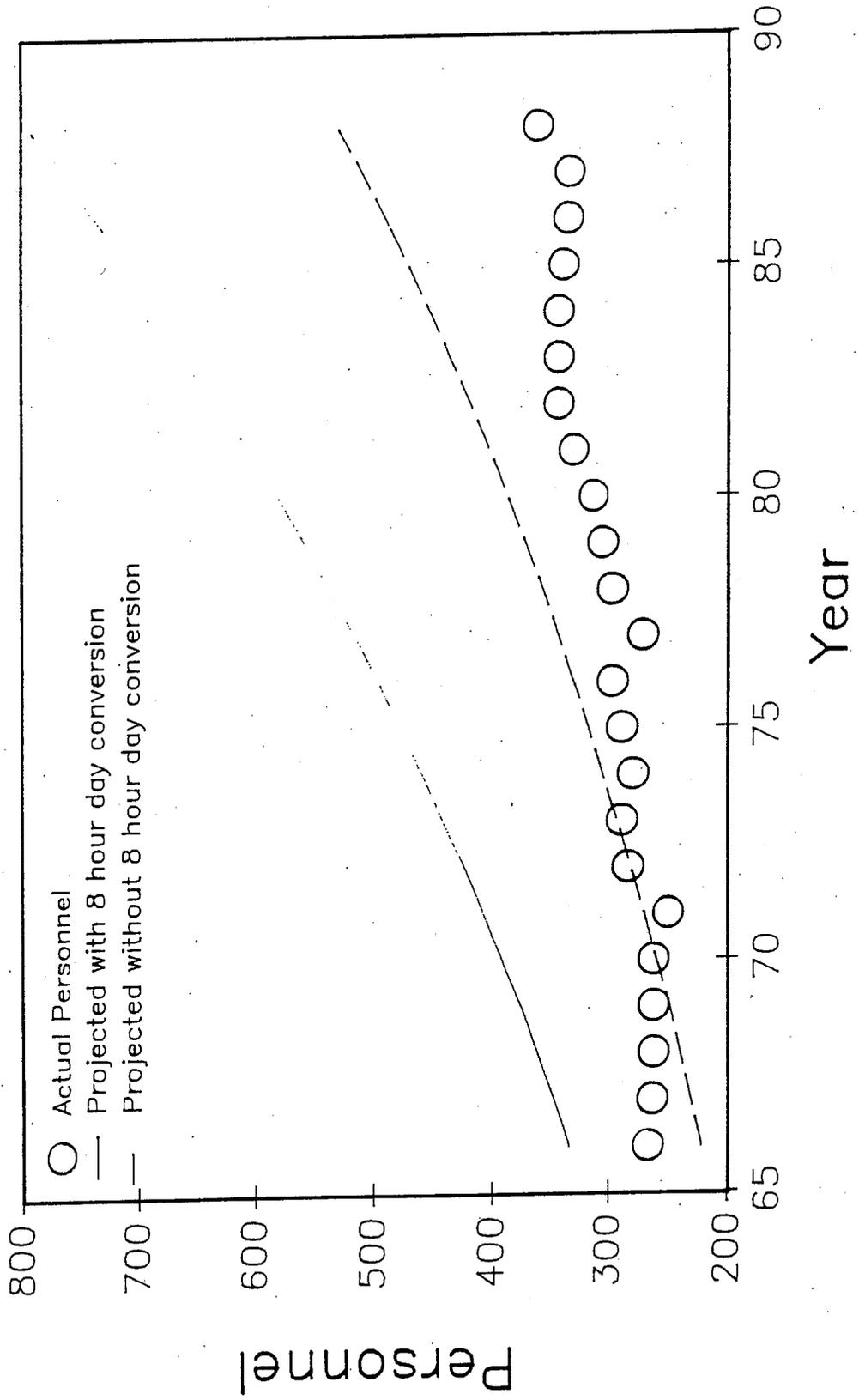
Current time budgets were calculated based on the SAP survey. From this survey of 31 wardens, average monthly time expenditures were calculated.

Two parallel calculations were needed due to the limitations of the survey. Some of the time spent driving was recorded and some was not. Time that was spent driving as a part of one of the defined categories such as sport patrol was recorded in the applicable category. Time that was spent driving outside of one of the defined categories was not recorded. This time needs to be accounted for because it can be substantial.

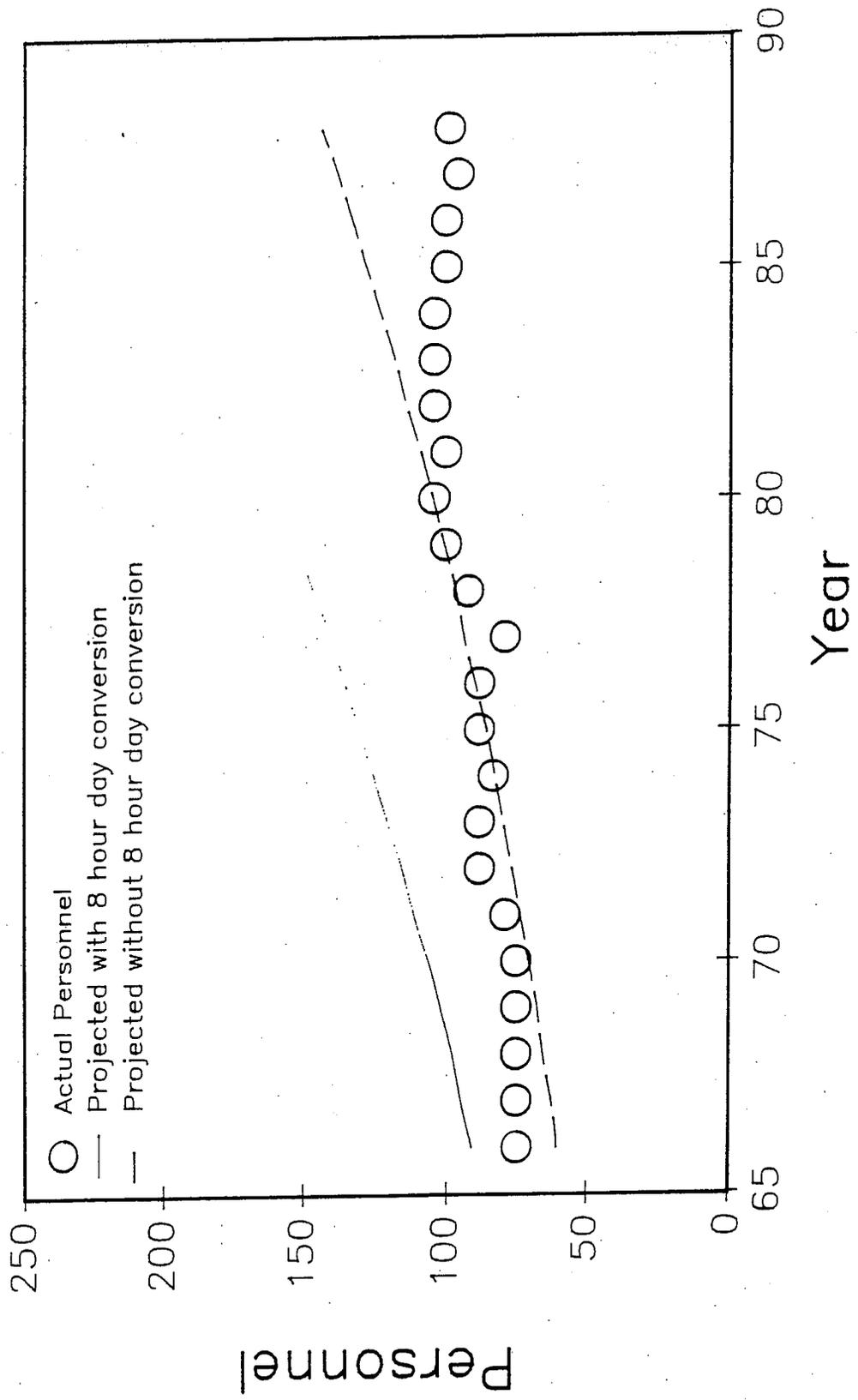
Since the actual amount of unaccounted for driving time could not be determined, extremes could be calculated. On one extreme, all driving time could be included in one of the defined categories. In this case no additional calculations are needed to calculate time budgets. On the other extreme, none of the time may have been included in one of the defined categories. If we can assume that on average, two minutes were required to drive each mile, then the average time spent driving each month would equal two minutes per mile multiplied by the average miles driven each month. This would add an additional category (DRIVING) to the SAP survey.

In reality, the true time budget would fall somewhere inbetween these two extremes.

Four Percent Growth Projection Versus Actual Growth Statewide



Four Percent Growth Projection Versus Actual Growth in Region 5



The total time spent per month working by each warden on average equalled 183 hours per month without the extra DRIVING category and 232 hour per month with the extra DRIVING category. Once again, the true value would fall somewhere inbetween.

hours_per_person := 183

hours_per_person_DR := 232

With 76 positions allocated to Region 5, the average time spent per month currently can be calculated.

current_people := 76

hours_per_region := hours_per_person · current_people

hours_per_region_DR := hours_per_person_DR · current_people

This provides the following results:

hours_per_region = 13908

hours_per_region_DR = 17632

The average time spent in Uncommitted Patrol (UCT) monthly per warden was equal to 3.8 hours per month. The total time spent in UCT per month was calculated as the following:

UCT_per_person := 3.815

UCT_per_region := UCT_per_person · current_people

UCT_per_region = 290

The total time per month spent on activities other than UCT can be calculated as:

non_UCT := hours_per_region - UCT_per_region

non_UCT_DR := hours_per_region_DR - UCT_per_region

non_UCT = 13618

non_UCT_DR = 17342

The goal is to keep the non UCT constant and to increase the UCT until UCT equals 35% of the total time. Another way to write this is the following:

$$\frac{\text{UCT_per_region} + \text{new_UCT}}{\text{hours_per_region} + \text{new_UCT}} := 0.35 \quad \square$$

This equation can be rearranged as a function to solve for the amount of new UCT needed.

$$\text{new_UCT}(pc) := \frac{pc \cdot \text{hours_per_region} - \text{UCT_per_region}}{1 - pc}$$

$$\text{new_UCT_DR}(pc) := \frac{pc \cdot \text{hours_per_region_DR} - \text{UCT_per_region}}{1 - pc}$$

where pc is equal to the fraction of the total time required to be spent in Uncommitted Patrol (UCT). Solving for 35% provides the following:

$$\text{new_UCT}(.35) = 7043$$

$$\text{new_UCT_DR}(.35) = 9048$$

The number of new personnel required to work these additional hours can be calculated in two ways. First we can assume that the new people will work the same number of hours as the people currently working. This can be calculated the following way:

$$\text{new_peop}(pc) := \frac{\text{new_UCT}(pc)}{\text{hours_per_person}}$$

$$\text{new_peop_DR}(pc) := \frac{\text{new_UCT_DR}(pc)}{\text{hours_per_person_DR}}$$

$$\text{new_peop}(.35) = 38$$

$$\text{new_peop_DR}(.35) = 39$$

The second way to calculate the number of personnel is to use the Planning Availability (PA) statistics to adjust monthly hours to their appropriate levels. First we calculate the total monthly hours needing to be worked, then we calculate the hours available per person. From that the number of personnel and the number of new personnel can be calculated.

```

total_hours(pc) := hours_per_region_DR + new_UCT_DR(pc)

total_hours_DR(pc) := hours_per_region_DR + new_UCT_DR(pc)

hours_per_day := 8
days_per_month := 16
hours_PA := hours_per_day days_per_month

peop_PA(pc) :=  $\frac{\text{total\_hours}(pc)}{\text{hours\_PA}}$ 

peop_PA_DR(pc) :=  $\frac{\text{total\_hours\_DR}(pc)}{\text{hours\_PA}}$ 

existing_peop := 76
new_peop_PA(pc) := peop_PA(pc) - existing_peop
new_peop_PA_DR(pc) := peop_PA_DR(pc) - existing_peop

```

These equations allow the calculation of the range of new personnel needed to have 35% uncommitted time within planning availability guidelines:

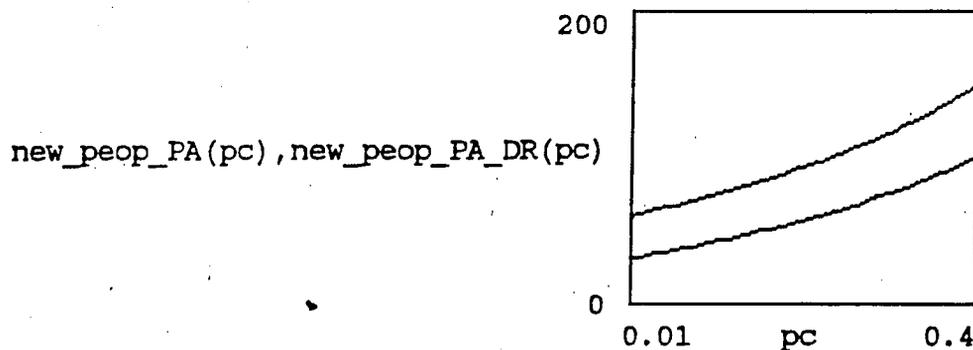
```

new_peop_PA(.35) = 88
new_peop_PA_DR(.35) = 132

```

The true value lies somewhere between 88 and 132. The equations above also allows for the calculation of new personnel needed for other UCT percentages. We can calculate this for values between 1% and 40%.

```
pc := 0.01, 0.02 .. 0.40
```



This plot shows that as the percentage of UCT needed increases, the number of new personnel increases as well. The area within the two curves represents the needed increase.

Hobson's methodology resulted in a recommended increase in staffing of between 88 and 132 positions regionwide in addition to current numbers to achieve the optimum 35% uncommitted patrol time (UCT). Examination of operational options and evaluation of intermediate staffing increases were made to permit flexibility in requesting staff augmentations. The operational options presented by the study information are:

- * Reducing Committed Activity with constant personnel numbers.
- * Increase personnel numbers with constant Committed Activity to obtain desired Uncommitted Patrol Time.
- * Maintain present Committed Activity and personnel numbers available and provide desired Uncommitted Patrol Time through overtime or changes in deployment.
- * Combination of the three former options.
- * No change in personnel numbers which provides Uncommitted Patrol Time below optimum levels.
- * Modify or create more flexible department priorities, goals and related objectives.

The positions selected as S.A.P. survey positions and any additional positions are only eight-hour a day positions. This estimate of needed positions does not consider shift work or 24-hour coverage, which is typical in most enforcement agencies. Other variations are possible when the emphasis on specific goals or activities are modified in response to Department Policy resources needs or the public. The public survey and current policies or operational emphasis strongly suggests and supports an increase in field enforcement. Legislative and constituent concerns also strongly support staffing increases within the State.

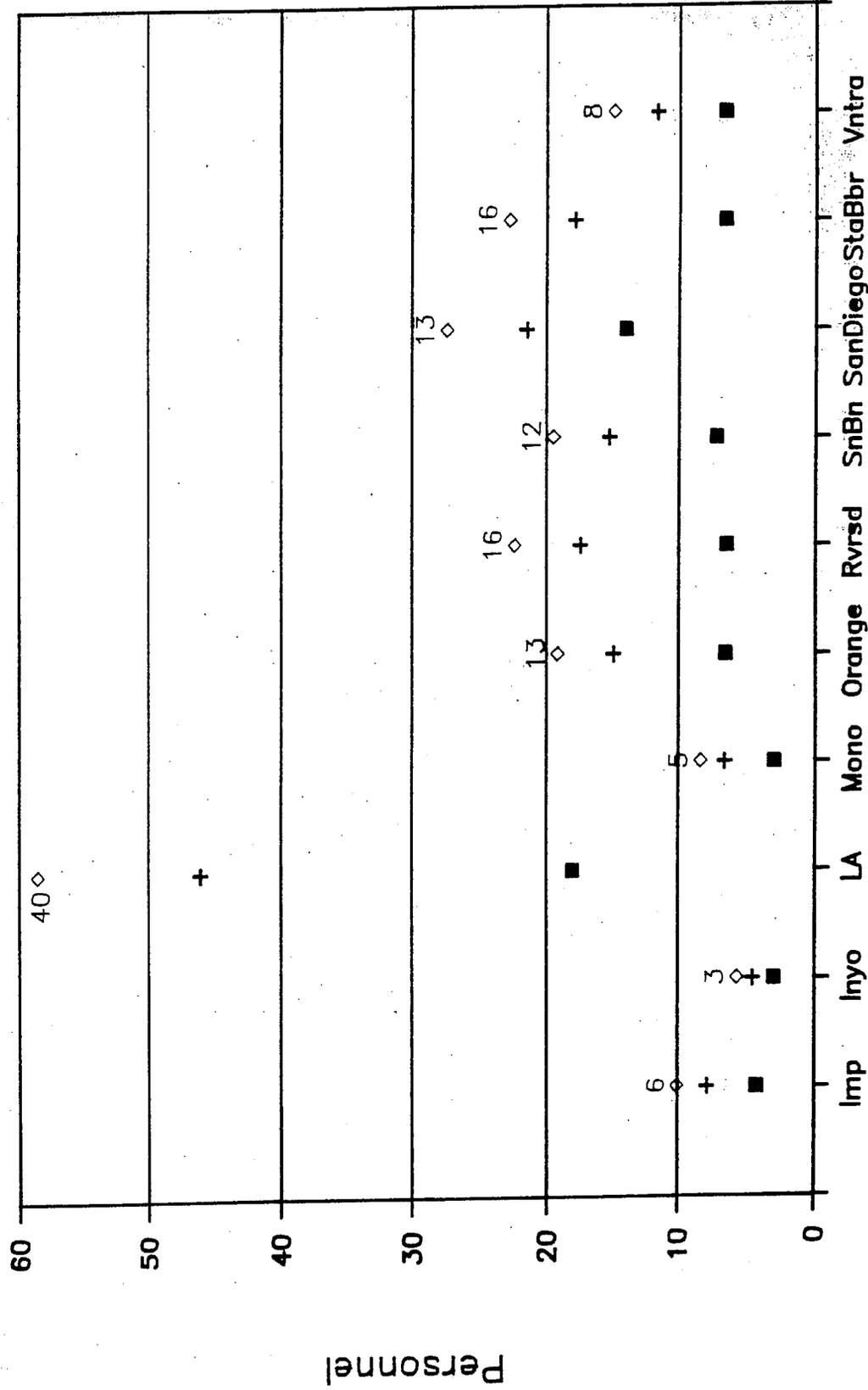
The PASATAC Study demonstrates the specific needs in R5 WLP and may be a reliable basis for evaluation of the remaining region WLP function as well as other functional entities in the Department.

3.0 Determining Staff Deployment

Figure D3 shows the application of Cowles deployment per county to the figures determined by study methodology.

Current & Needed Personnel by County

Numbers Indicate New Positions



■ Present + Needed (w/o DR) ◇ Needed (w/ DR)

ACKNOWLEDGEMENT

The initiation and completion of this study required the dedicated involvement of many staff, executive and regional personnel of the California Department of Fish and Game. The authors thank the PASATAC Steering Committee, including R5/WLP Captains, other Regional Patrol Chiefs, Chief of Patrol DeWayne Johnston and management personnel of the various units who provided their opinions on the relative importance of goals and personnel work activities, aware that this phase was a critical part of the study. The authors also wish to thank Dr. Cleveland Cowles, Dr. Robert Giles, Virginia Polytechnic Institute; and David Hobson of Manpower Needs Development Company for their contributions, guidance and technical assistance during the study period. The authors are appreciative of the various individual functional and Department technical services units providing access to many comprehensive computerized data bases which provided the largest share of information in support of the project. Special appreciation is extended to the R5/WPD Reserve Wardens, temporary and full-time clerical staff, and Gracie Herrera, for their assistance in data access, organization and document preparation. For those data which were unavailable at the beginning of the study, the authors are grateful to many regional headquarters and associate agency staff for their assistance in compiling the necessary information, helping this work reach its conclusion. The authors extend much appreciation to the public for their participation in public surveys and to Dr. James Fletcher, Jon Hooper, Ph.D., Michael King, Ph.D., and staff, Chico State University and Sandra Wolfe, DFG, for their efforts on a comprehensive public survey conducted concurrent with this study. Special thanks also go to Jim Berksen, Statistical Method Analyst III, for his input as a co-author and specialized statistical assistance during the critical analysis phase of this study. Lastly, the authors wish to thank the WPD field personnel for the cooperation, patience and support, without which this project could not have been completed.

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APPENDIX

Preparation of raw data in presentation format is pending.
Information is available on request.

Based upon data from PASATAC study of 1992 (the last year with categorical data)

one two three four sum

General Activities to be divided between hunting/fishing and non hunting/fishing funding

Admin	966.6	985.2	1072.4	1090.7	4114.9	20.4%	4114.9
Court	119.2	105.9	70.0	119.5	414.6	2.1%	414.6
License	27.3	93.9	33.8	46.0	201.0	1.0%	1.7%
Training	571.5	547.8	915.6	1238.3	3273.2	16.2%	3273.2
						39.7%	

Patrol Activities for non hunting/fishing activities

Streambed	361.5	352.4	335.7	165.1	1214.7	6.0%	10.0%
Depredation	107.7	136.3	101.0	82.5	427.5	2.1%	3.5%
Pollution	178.6	183.1	198.2	161.5	721.4	3.6%	5.9%
Non-sport	307.2	262.0	200.2	220.5	989.8	4.9%	8.1%

16.6% 27.6%

Patrol Activities from Hunting/Fishing/Commercial Fishing & Hunter Ed Funds

Special Ops	87.3	127.9	84.5	77.0	376.7	1.9%	3.1%
Pub Ed/Hunt Ed	241.3	203.6	71.4	190.3	706.6	3.5%	5.8%
Sport Patrol	1927.4	1373.0	1021.5	1701.6	6023.5	29.9%	49.5%
Illegal Comm	307.2	262.0	200.2	220.5	989.8	4.9%	8.1%
Commercial	126.8	173.3	361.7	54.9	716.7	3.6%	5.9%
					12167	43.7%	72.4%
					20170		